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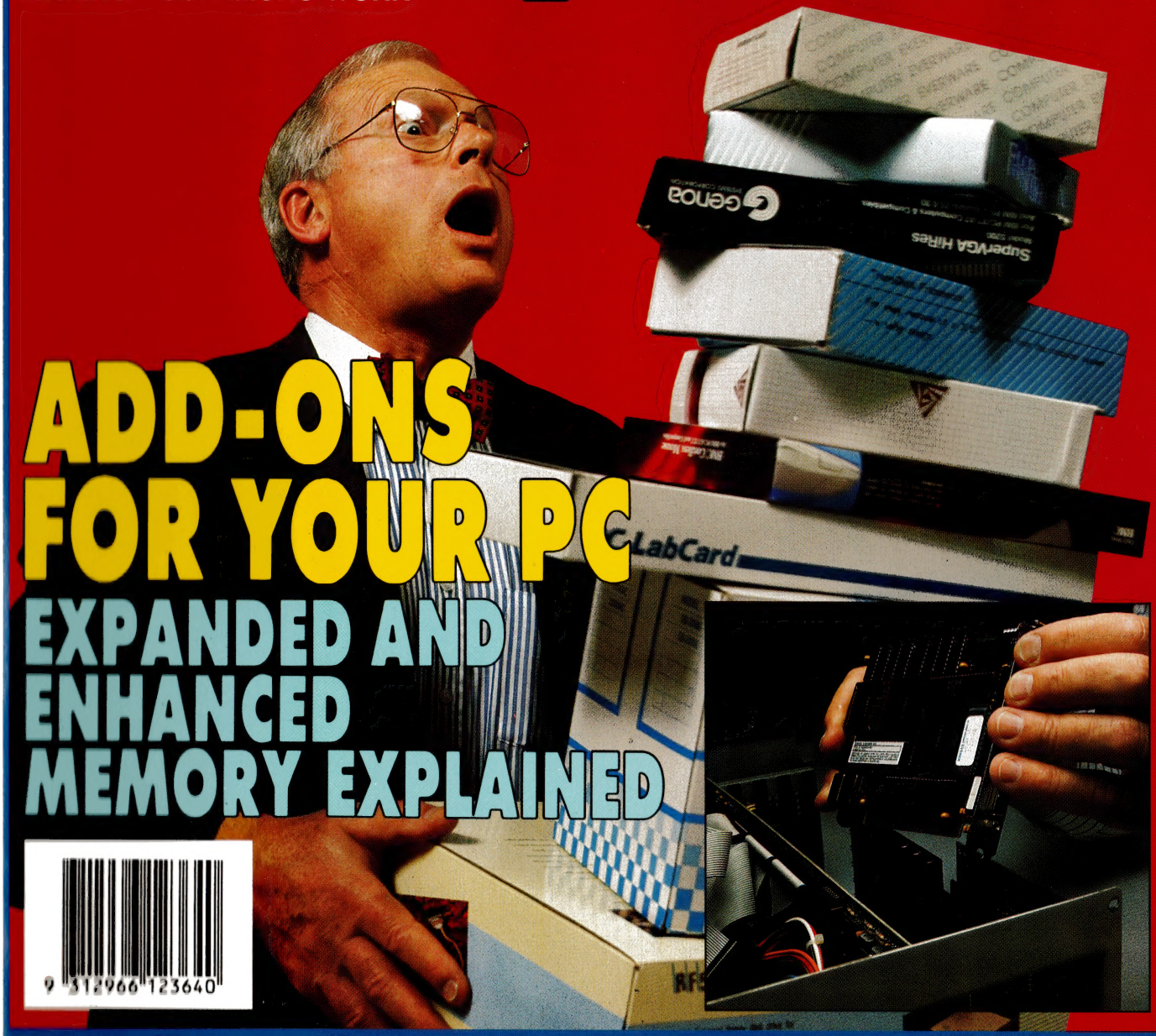

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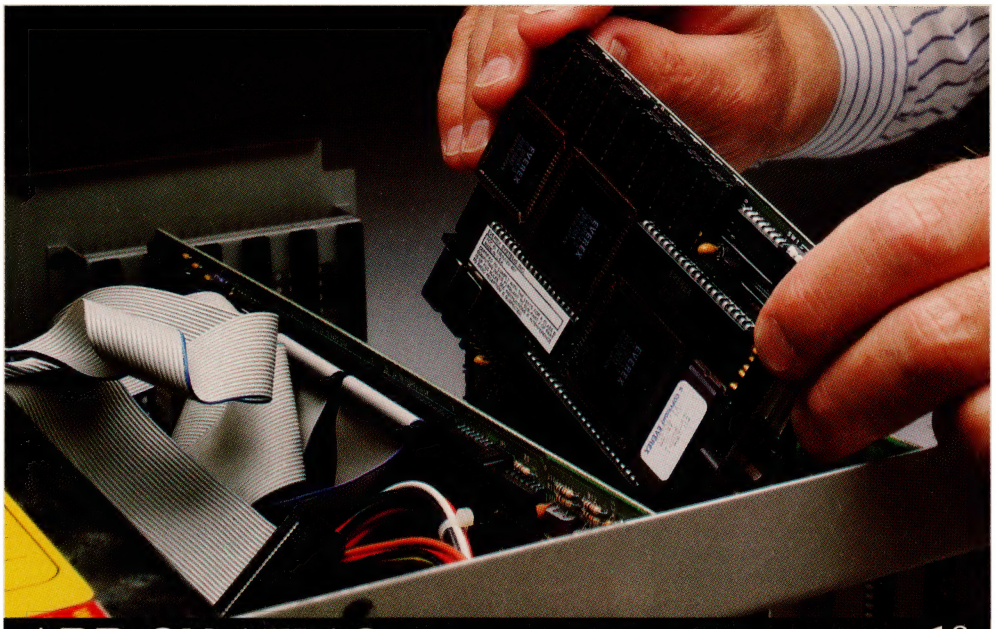

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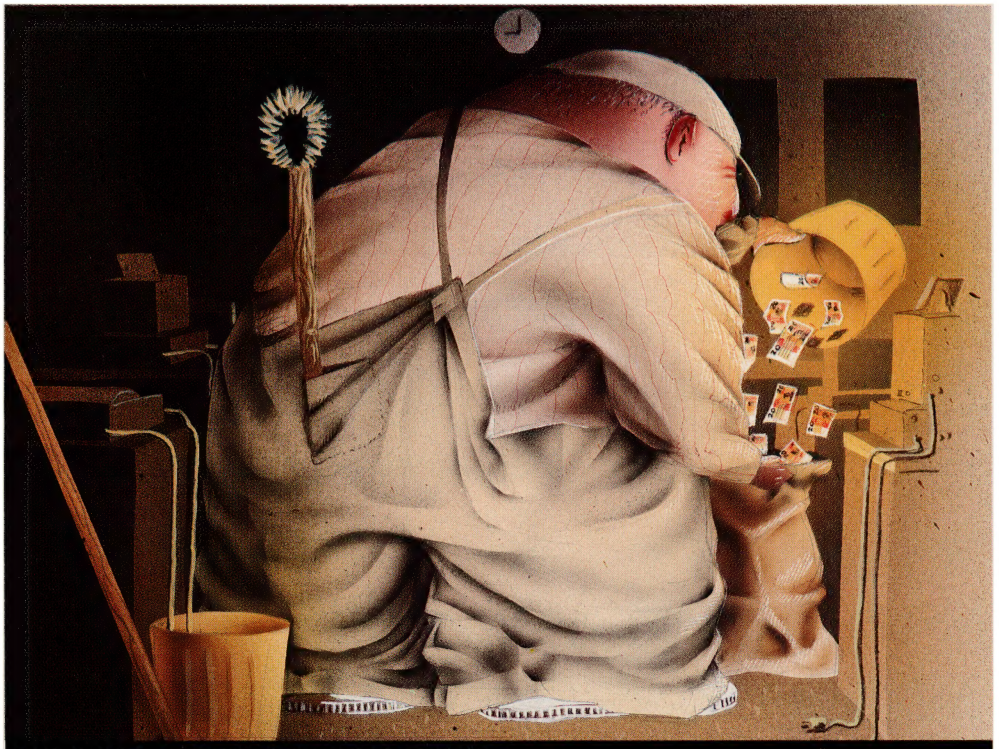

WASTE BY COMPUTER 66

NEXT MONTH INCLUDES

WITH THE RELEASE of i486-based systems, Unix has taken a giant leap forward – but whatever happened to the much-touted standard-to-be, Posix? Our feature on Unix will also consider just how real an alternative this 22-year-old operating system has become – and at what price to users. Back in the Dos world, we have a look at one of the most powerful application developers currently available, compare a range of integrated packages, show how to develop your own menu system and compare two electronic Bibles. For the bigots, our new columnist, Vernon V. Shrunkle, tells how to shop for a PC.

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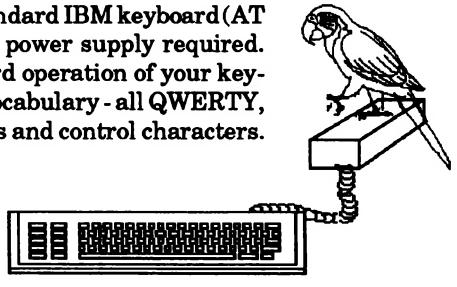

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JAKE KENNEDY

Be warned!

BE WARNED: Computer viruses are real and at large! While I was silently thanking our stars that we hadn't had the misfortune of sending out thousands of virus-infected disk to readers – when it happened. (Even Les Bell, long-standing industry guru and former *YC* editor was an 'offender' with his own publication.)

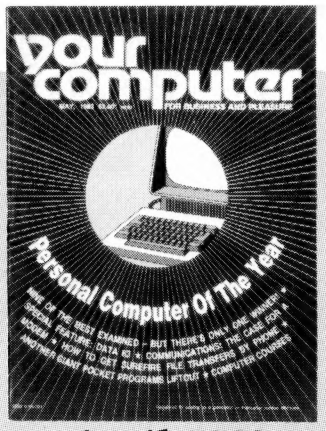
As part of our subscription offer in February, we sent the first 500 subscribers a copy of the Shareware spreadsheet, AsEasyAs, compliments of Ian Mackay's Manaccom. Embarrassingly, the disks all had a truncated version of the Marijuana virus on it. Fortunately, it will only infect the computer if the machine is booted from the disk. While the first disks were sent out some time ago, the only reports of the virus we've had, have come from users who (prudently!) ran a virus-checker on it.

The infection came from a software developer who demonstrated a new program on a machine at Manaccom. The same machine was then used to write a message to recipients of the disk – the lesson there is don't trust any disk – even if it comes from your best friend. (In our June issue, Mark Cheeseman will describe a number of different types of viruses, how to detect them and how to protect your computer against them – it's essential reading for anyone who uses their floppy drive or modem and hasn't yet installed any protection.)

As soon as we became aware of the problem, Ian contacted Roger Thompsom of Brisbane-based Leprechaun Software (he's the developer of Virus Buster and the man we use for advice on viruses). Roger kindly donated to the public domain a virus killer called Aspirin, and the next day Manaccom forwarded a copy to all of the original recipients, with a letter of explanation.

If you received a copy of AsEasyAs and not received a copy of Aspirin, give Manaccom a call on (008) 777 601. ***Note: only those disks sent out as part of the subscription offer were affected.***

So – be warned and take care!



April 1983

A memory expansion board of 8 to 24 kilobytes is now available for the Commodore Vic-20 – ***News, p7.***

A human voice digitised onto computer chips ... has advanced voice-handling technology to the stage where computers are answering telephone calls in a way indistinguishable from humans! – ***News, p11.***

[NEC's APC] may well succeed in the marketplace like no other Japanese computer before – because of co-operation between the Japanese hardware designers and the United States office, which worked on the software – ***Computer of the Year Awards, p32.***

Apology for BLAH

IN OUR PRINTER feature in March, we gave the wrong phone number and name for the distributor of GoScript, a PostScript 'clone'. The distributor is not BLAH, but Logo and the correct phone number is (02) 819 6930. Our apologies to Logo and any readers who may have been inconvenienced. □

Future Features

IN ADDITION to our application stories, news and other informative pieces, each month we present features designed to keep you informed about the world of personal computing –

July 1990

Desktop Presentation: Desktop publishing, computer-based videos, presentation graphics, scanners ... the tools now available to all businesses to enable them to make effective, low-cost presentations with a professional cast.

August 1990

Monitors: Whether you want to upgrade your PC or Mac monitor to color, add a VGA card or find a monitor to use with your portable or new system, our survey will clarify the jargon and bring your choice into focus .

September 1990

Entry-level PCs and ***Networking:*** As the price of power drops, the low-price machines have become more powerful and now offer more to small business users. Our survey and guide to PC purchasing will show you how to match a system to your needs. Also in this issue is a special feature on understanding, choosing and implementing a PC network.

October 1990

Communications: Our indepth coverage of electronic communications will tell of the latest developments in 'connectivity' and present an overview of the hardware and software that's bringing it all together – from the latest in modems and fax cards to the vast range of online services.

November 1990

Graphics: With the power now available to most users, graphics are being used more extensively and imaginatively than ever before. With emphasis on small business applications, we will describe the exciting changes now taking place in computer graphics.

December 1990

Integrated packages: Our survey of the latest full-featured offerings highlights the strengths and weaknesses of this growing range of flexible applications. This issue also features project management software and the latest in handheld computers.

Application stories – particularly those with the same theme as our features – are always welcome. Because of lead times, material must be received at least eight weeks prior to the month of intended publication. Please address editorial enquiries on our features to Mark Cheeseman, (02) 693 4143, and advertising enquiries to Mark Wilde, (02) 693 6646.

AMERICAN GRAFFITI

HOWARD KARTEN

The aftermarket

IF YOU'VE BEEN involved with computers for any length of time, you've probably seen those comparisons of computers and automobiles. They say things like 'if automobiles were like computers, they'd get 1,000 miles to the gallon and cost 97 cents,' or 'if automobiles were like computers, they'd go from zero to 60 in two picoseconds and ...' (I'm always tempted to ask, yeah, but would I get another ticket for having a noisy disk drive? And, when you heard a funny noise, would it always mean you needed a part available from the dealer only, that is, at a cost roughly large enough to fund a small AI project?)

Actually, as I thought about it, I realised there are quite a few parallels that can be drawn between computers and cars. For example, the aftermarkets – the automobile market, as it's called here in the States, and the add-in boards for PCs. In both cases, you begin to notice the aftermarket almost the instant you get the thing home.

For openers, you start noticing that the range of products you can buy to enhance your car is seemingly limitless – seat covers, designer motor oil, air conditioners, stereo, fuzzy dice ... It's becoming that way, too, with computers.

In both cases, the products sold in the aftermarkets can add significant value to the 'base' product. The computer aftermarket, though, seems somewhat more competitive and innovative.

For example, I recently received a catalog of upgrade boards for the PC. (These catalogs arrive at The Word Factory with some regularity these days. I suspect that Ms Computer Writer has sold my name to mail-order vendors so that they will inundate me with catalogs, and possibly, shame me into upgrading my creaking, early-vintage PC.) I was interested to note that this vendor offers '286- and '386-based motherboards to replace the original 8088-based motherboard. To the best of my knowledge, you can't buy a souped-up engine for a 1932 Excalibur.

By contrast, I could upgrade my vintage PC with a '286-based board for US$200, which is really quite a bargain; a motherboard using the 80386SX CPU, rated 15 to 20 times faster than an XT, goes for US$400. Both, the catalog is careful to note, are drilled so that they will fit in your current case. (This is a significant specification. I once bought a powerful battery for my car, but could not bolt it down immediately. First I made the rounds of the hot-rod stores for two to three weeks looking for a thingy to hold the battery down, and then I made excuses for two or three weeks to avoid any more frustration. Finally, I did what I had been trying to do unconsciously all along – forgot about it entirely. Six months later, the extra vibration had ruined the battery.)

Incidentally, there's a very heartening lesson for the computer market which can be drawn from the auto aftermarket, and that's that products from the aftermarket will probably let you keep any computer running long after its become an antique.

Catalogs arrive at The Word Factory with some regularity these days.

Yet another parallel can be drawn between the two markets. Perhaps the most instructive of all is how they manage to capture the attention of some males of all ages. Ever notice how it's always males who become entranced with cars and computers? Why that is, I don't think science has yet discovered.

A sad story

THAT BRINGS to mind the sad story of an acquaintance and his experience with add-on boards. My friend Stan was one of those people who throws himself into anything and everything he does. Stan was fortunate enough to have dreamt up a gizmo the world had been waiting desperately for – it was a kind of computerised version of the pet rock, actually, the details are unimportant here – and had eventually sold the company and retired early and rich. He had invested the proceeds, which meant, of course, that he had to manage those investments. Naturally, he turned to his computer for that.

Stan had always been something of a gadget freak. Moreover, when he'd been running his company, Stan had been so busy he didn't have the time to indulge that passion. Now, he was making up for the enforced abstinence with a vengeance, and in the 24 months that he'd been watching his investments, he gradually assembled a formidable array of add-ons. (I should note, too, that Stan was something of a stubborn guy, as well as a bit of a sentimentalist, and had doggedly stuck with the early-model PC.)

He listed some of his add-ons for me recently: 'Well, of course, there's a memory board that lets me go up to 4Mb, and my VGA board. And, since I always used to preach 'integrated office', I decided that the only way to get fax abilities and be consistent was to put a fax board in my machine.'

I gently reminded him of his early and enthusiastic support of email. He happily conceded that he still sends and receives a good deal of email, and even uses his email account to send faxes. And, speaking of communication, there's that board in his machine that allows him to use voice mail. That, in turn, reminded him of his latest acquisition – a little gizmo that detects what's calling – fax, computer, human, or robot caller with a sales pitch – and routes it to the appropriate port. 'You know how strongly I believe in integrated systems,' he observed. Indeed I did.

By this point, I'd gotten him going real good, and he was on a roll: '... the universal disk controller, I just got, which will run a floppy of any capacity; the one coming in next week for the optical drive, the one ....' Suddenly, he turned to me: 'I've been trying to track down a new one I heard about last week, which lets you read disks formatted for a Mac. You don't know anything about that, do you?'

By now, I was beginning to be a little concerned. Since he appeared not to know anything about video frame-grabber boards and other specialised hardware for interfacing to the analog world, I figured I wouldn't mention it.

Turning to music

THEN, STAN STARTED on music, and said he was even thinking of doing some composing (this is from someone whose only previous musical experience was whistling at haughty-looking blonde women). In fact, he said the next time I was at his house, he'd love to show me the new MIDI board. It was attached to the synthesizer he'd previously acquired, and to a custom-built speaker system which ate up enough power to run a medium-sized mainframe.

Things were going pretty well, he allowed, but there were a few glitches. He eventually wound up with several CRTs, microphones (for a voice recognition board) and speakers (he'd bought two voice synthesizer boards – one with English phonemes, one with French). To have all that hardware in reach, he had to have a kind of 'environment' built, with CRTs and switches within easy reach – the way he described it – it sounded suspiciously like the cockpit of a Boeing 747. He'd also had to have his office rewired to have enough current for all that hardware. And, his wife was complaining – first she was a business widow, then he was always underfoot, now she's a gadget widow.

Perhaps it's a good thing autos are not more like computers. With all those add-ons, think how distressing the recalls would be. Think how annoying it would be to try to find a competent mechanic. Imagine how annoying it would be to have to open the case so often to check the oil. □

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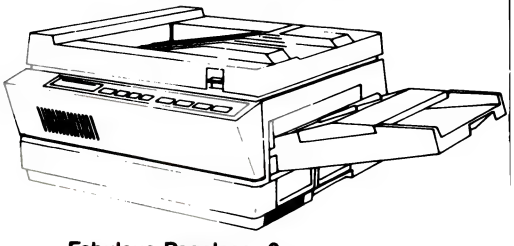

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CANBERRA COMMENT

WILLIAM OLSON

Bounty buoyed

A PROPOSAL TO remove the computer bounty which assists Australian computer companies has been rejected. The Bureau of Industry Economics recently told the government that the bounty should continue at a slightly lower rate of 17 per cent as from July. It suggested that any further falls in the bounty should follow general tariff reductions. (The government has a policy of lower protection for a wide range of Australian products including electronics equipment such as computers.)

Peter Moores, from In-Focus systems, recently demonstrated a new computer projector screen called Electroboard, to government training officers. He claims the screen is unique because of its triple layered liquid crystal display which produces the color. Three layers of red, blue and green allow a full screen display of eight true colors. With the chip changes being planned, the number of colors displayed will rise to 64.

Asked about heat from the overhead projector (OHP) affecting the screen, Moores said that modern overhead projectors used cooler globes so heat was not a problem.

The color Electroboard connects to most PCs as well as to the Macintosh range of computers. The cables and plugs supplied suit most computers.

'If you want to have the image displayed on your computer screen while the OHP is working, then we use a splitter box to send the signal to both. Macintosh computers are more difficult to set up because there is no external video output between the monitor and the computer. This means opening up the Mac to fit a special cable inside,' noted Moores.

'The army training command has recently bought 120 color Electroboards. They have a Prime system operating dumb terminals which is causing us a few headaches trying to get the output configuration. It is not a standard system and so far Prime have been unable to give us the configuration information we need.'

The Electroboard can handle simple animation on screen, however, if the movements are too fast there is ghost tracking. This is because the LCDs are struggling to keep up with the screen display as they switch on and off at a fixed rate.

An option with Electroboard is a 1Mb memory chip allowing 100 screens to be stored independently of the computer. At present, this option is only for monochrome screens – color uses up too much memory. The system also has an infra-red remote control for operating slides stored in the memory.

Organisations currently evaluating the color Electroboard include the Australian National University, University of Canberra, the Department of Social Security, the Health Insurance Commission, the Tax Office, the Department of Finance, and the Aboriginal and Torres Strait Islanders Commission.

Bob Hessinger (left) and Peter Ansell (right) from McDonnell Douglas at the Series X launch. Ansell claims the System X is a victory for multiprocessor architecture.

Computer charges dropped

PART OF A case against a former public servant for dishonestly using a computer was withdrawn in the ACT Supreme Court recently.

Andrew Laurence James McDermott pleaded not guilty to eight charges. The charges, some of which were later dropped, included receiving secret commissions, stealing Commonwealth documents and corruption. McDermott was alleged to have committed the offences while working with the Department of Primary Industry's Australian Fisheries Service in '86 and '87.

McDermott, defending himself in court, told the jury in an unsworn statement how he had been arrested at his parent's home three days before Christmas in 1987. He alleged the police had harassed his friends and family following his arrest.

Among the charges laid was one alleging McDermott had corruptly transferred 158 fishing entitlements between accounts stored in the department's computer. The fishing entitlements or boat units were worth about $3,000 each.

He said that the computer register of boat units was only an easy means of accessing data. The actual boat unit register was on hard copy files. He also stated that he made no attempt to alter the hard copy files.

McDermott had transferred the 158 units while he was trying to balance the computer records with the paper records. He said that as he had set up the computer register, he was the only one who

knew the correct way to transfer files. His work on the files system had been interrupted when he had to go away on business for the department. When he returned, the computer system was frozen and he was subsequently charged with the alleged offences.

Chief Justice Miles ruled that the charge of dishonestly using a computer could not succeed as a matter of law: 'It seems to me that the law that makes it a crime to dishonestly use a computer is directed only at machines designed to be operated by a coin, token, banknote or identifying card. Section 115 of the NSW Crimes Act 1900 is directed at the misuse of machines like teller and vending machines.

Technology expo

THE ANNUAL government technology awards were announced recently. Australian Customs won a gold award for three packages. One, called Interim Edifice, which automatically allows data entry from importers and customs agents into the ACS computer system. The other two systems report all cargo going to and from Australia.

A gold award also went to the Department of Administrative Services for Nomad 2 – a personnel management system.

During the exhibition held in conjunction with the awards, Australia Post released its lettergram computerlink service. With its MS-Dos software, PC users can now dial up Australia Post's lettergram network to a post office nearest their receiver. The message is then delivered either by Australia Post courier or through the regular postal service.

Australia Post also intends introducing optical character readers (OCR) to help sort postcoded mail. The 36 OCRs planned for mail centres will scan up to 3,000 letters an hour.

Electronic Counter Service is another expansion Australia Post plans to have running by September. Five states will install 1,300 terminals in post offices to deal with Commonwealth Bank transactions, telephone accounts, as well as electricity and gas bills.

System X

FROM A PROMINENT spot at the entrance to the Government Technology Expo, McDonnell Douglas announced its new Unix computer called System X. Peter Ansell, marketing manager for McDonnell Douglas, said that the System X is a victory for multiprocessor architecture. He also said the problem of linking processors was now solved with this system as it is able to make full use of up to 20 processors. The problem with multi-processor machines in the past had resulted in a 30 per cent reduction in efficiency for each processor added on. At this rate, adding extra processors quickly became futile.

The color PCV5 triple layered screen sits on top of any overhead projector (OHP) replacing the normal plastic slides. Moores has displayed the system in a large lecture theatre at the Australian Defence Forces Academy. Using a color Mac II as the source, the screen gave excellent definition when enlarged to more than two metres in height.

McDonnell Douglas has brought their System X computer across from a small US company, Encore Computers. Ansell described Encore as a brilliant technology company that needed the marketing and financial support skills of McDonnell Douglas.

'We've found the McDonnell Douglas aircraft name to be a real door opener for computer sales. When we first started out two years ago we tried avoiding the aircraft association – now we realise it is the best way to sell computers,' Ansell said.

One area where McDonnell Douglas specialises is in health administrative systems. Ansell says that the Queensland Health Department recently accepted an $80 million computerised health system. Relational database management systems such as Oracle, Informix and Imgres will be available on Series X. A fully configured Series X system will support 1,000 terminals. □

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INDUSTRY UPDATES

Borland on its own!

Borland Pacific's new general manager, Belinda Hanna, described the company's marketing strategy in terms of consolidating its government and corporate accounts. This is to be done by establishing a Corporate Computing Program to provide members with high-level service and technical support; by establishing a Developers Forum to encourage use of the Turbo languages; and by implementing an Accredited Training Centre Program to ensure users are receiving full benefit from Borland products.

PC SOFTWARE manufacturer Borland, has opened a regional office in Australia, called Borland Pacific, in Lane Cove, a Sydney suburb. The general manager is Belinda Hanna, well known in the industry for her flamboyant product releases while Borland product manager for Tech Pacific. Following his visit to Australia in October 1989, Borland president Philipe Kahn decided that the region warranted a higher degree of company involvement.

To date, Borland products have been distributed by a number of companies in Australia, but over the past several years distributor Tech Pacific has supported the range. Graham Pickles, managing director of Tech Pacific, said at the office 'launch' – held on an island in Sydney Harbour – that '[we] will continue with a strong relationship with Borland through an equity relationship in Borland Pacific. But, the new entity will be an independent operation handling its own warehousing, distribution, administration, marketing, sales and hotline technical support.'

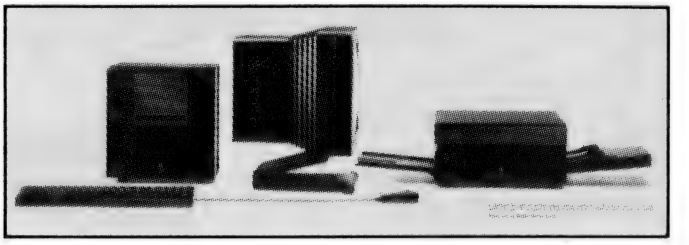
Tech Pacific saw Borland sales grow from $2 million in 1987 to $9 million last financial year. Hanna noted that she expected sales this year to reach $14 million. Borland Pacific can be reached on (02) 418 7330; fax (02) 418 7307. □

Pain in the AIX

IBM HAS formally recognised that there is a problem in running AIX, its implementation of Unix, on the PS/2 Model 70 series. Late last year, NewsBytes discovered that AIX did not run on its IBM-supplied PS/2 Model 70. After contacting IBM Belgium, the problem was reproduced in the IBM labs, with the result that the Newsbytes machine has been submitted for testing to IBM's Boca Raton labs.

According to Mr. Clerckx, IBM Belgium's OS/2 product manager, the problem which prevents the PS/2 Model 70 from running AIX and its attendant applications software has not been traced. 'We realise there is definitely a problem with the Model 70, not only with your system but with the Model 70 in our lab. We will be shipping the system back to the Boca Raton design lab where IBM researchers are expected to trace the design fault,' he said. □

An English NeXT



Color is next for NeXT – and a 40Mb hard disk version has been released in the UK.

APPLE COFOUNDER Steve Jobs, the founder of the oddly-capitalised NeXT Incorporated which produces the innovative workstation of the same name, has announced that Businessland will exclusively market and support it in the UK. Businessland already controls retail distribution of the workstation in the US.

Amidst much press interest, Jobs and senior Businessland staff unveiled the NeXT workstation at a glitzy ceremony at the London Palladium. Jobs caused a stir of interest when he revealed that a color version of the machine will be available by the end of the year. Existing versions of the NeXT system would, he said, be upgradable using a plug-in color card.

The unit's basic configuration is 8Mb of RAM, with a 256Mb optical drive bundled software for UKP6495 (about $14,000). Unexpectedly, the UK NeXT configuration will include a 40Mb hard disk.

Jobs was his usual ebullient self, claiming that every major software developer, with the exception of Microsoft, is working on software for his machine. 'Most workstations have never seen ease of use software. I've seen many more middle managers getting involved in strategic decisions using NeXT machines, and I've seen internal meetings at NeXT cut by 50 per cent. We're competing at the applications level,' he said. □

And now 'palmtops'...

JAPANESE COMPUTER makers hope palmtops will be a hit with the buying public in the same way that the notebooks have been. While NEC and Kyocera have announced plans to release palmtop computers by the end of the year, Sony has already done it.

Sony's keyboardless PalmTop Computer – the PTC500 – which recognises handwritten characters – was released on the first of April with a price of 198,000 yen ($1720).

The new computer uses fuzzy logic to recognise more than 3500 handwritten Japanese characters drawn on a 6 *x* 4-inch pen-sensitive screen. The technology converts them into digitised characters that can be printed on a printer using fuzzy logic. This fuzzy logic allows the PalmTop to recognise more than one million variations of the characters to match each user's writing style.

The time and place of an appointment, for instance, can be written on the screen and filed into a calendar, and the computer will file the appointment into the proper place in the user's schedule, which then can be called up for review.

The PalmTop measures 205 *x* 158 *x* 45mm and weighs only about 1.3kg. It has a Motorola 68000 processor, 320K of memory and operates for about six hours with a fully charged battery. Sony expects to produce one thousand units a month. In the future, Sony plans to enable the PalmTop computer to read handwritten characters as fast as a keyboard-based computer, because the current version is still slow to input data. There are plans, but no dates, for an export model.

The Kyocera palmtop – developed in conjunction with Microsoft and Justsystems – is expected to be very similar; no details are available for the NEC offering-to-be. Kyocera is said to be seeking alliance with bookstores and publishing firms as sales channels for the tiny computer.

Meanwhile, in the US, Intel's Dick Pashley, general manager of the firm's Flash Memory Operation, also the assistant general manager of the memory components division, shared his vision of the palmtop with reporters and analysts recently. Pashley said that by the year 2000, the most popular computer on the market would be what he's coined 'The Flash Notebook,' a half-pound, one- half-inch thick, 7 *x* 9-inch palmtop machine. The computer would have a built-in modem, fax machine, cellular telephone and television. Onboard would be 50Mb of Flash memory and a 200-hour rechargeable battery. All of this would be priced at the equivalent of US$250 in today's dollars. □

FidoCon Oz!

AUSTRALIA IS TO host its first FidoNet convention – FidoCon Oz! 1990 – at the St. Kilda (Melbourne) headquarters of the Australian Institute of Management during the Queen's Birthday long weekend, June 8 to 11, 1990. FidoNet is a world-wide network of some 6,000 bulletin boards. This is the first time the gathering of SysOps has been held outside the US.

The convention will feature speakers from Australia and overseas, panel discussions and workshops, one of which is for new (or intending) SysOps. Amongst the topics to be covered are the prevention and cure of computer viruses, communications software, bulletin board software, computer fraud, modems and telecommunications. Speakers will include Joachim Homrighausen (author of FrontDoor and Tosscan), Det. Sgt. David Thompson of the Victorian Police Computer Crime Section, and Chris Freeman, well-known computer virus expert from the Chisholm Institute of Technology.

Details of FidoCon can be downloaded from any FidoNet bulletin board. For more information, contact Andrew Rajcher (03) 266 3727 – by modem, (03) 509 4417. □

IT benefits small business

A REPORT by the Federal House of Representatives' Standing Committee on Industry, Science and Technology has concluded that the introduction of information technology (IT) could save many small businesses from failing.

The report found that IT could provide the answer to communications problems encountered by many small companies, seen as a main cause for business failures. It is generally acknowledged that before companies can take full advantage of IT, training and support has to be of a sufficient level to encourage small business operators to embrace the technology.

The report notes that small businesses could learn about IT benefits from a database planned by the government and small business associations. It will provide online information about government tenders and projects and will be available to any company. □

Pushing Windows

JAPAN'S PERSONAL computer makers have decided to launch an unprecedented marketing campaign for Microsoft's MS Windows. NEC, Japan's PC giant, is considering a service to sell its PC-9800 series bundled with MS Windows, while IBM Japan and Seiko-Epson started shipping in April. Also, Fujitsu has decided to install a version of Windows on its slow-moving FM-Towns personal computer.

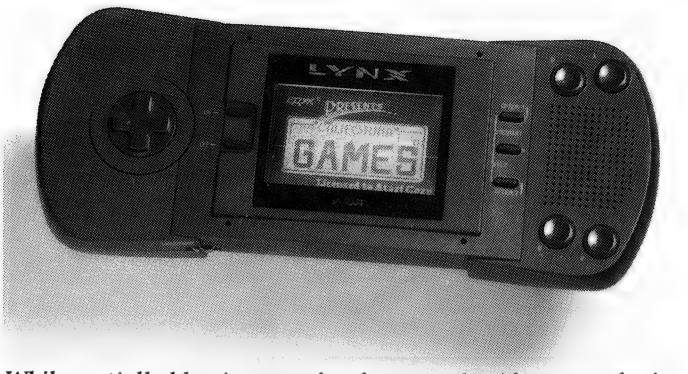
The program is not as prevalent in Japan as it is in the US or Australia, most likely due to NEC's failure to promote it. Some 35,000 MS Windows 2.11 packages have been sold in Japan since the program was released 12 months ago. □

US market flat

ACCORDING TO a study released by the Gartner Group, an industry researcher, the net profit margin for US computer manufacturers dropped to 3.9 per cent in 1989, down from 8.3 per cent in 1988. The firm's analysis was conducted on about 80 per cent of the publicly traded companies and showed that US firms would have to depend on the international market place for expansion as the domestic market has essentially gone flat. A senior research analyst with the group, Randall Brophy, noted the fourth quarter growth rate was the industry's lowest in three years and indicated slowing of US demand.

In discussing the details of the survey in relation to individual firms, Brophy indicated that, even with overall industry growth down, individual firms such as IBM (19 per cent growth in personal computers) and Compaq (39 per cent growth in PCs) did very well in 1989 while others, notably Apple and Tandy had mixed performances. Both of the latter firms increased their market share with high-end business systems while experiencing difficulty with the low-end markets. □

Atari on the rise



While partially blaming a market downturn in video games for its lacklustre performance in 1989, Atari hopes to regain market share with the Lynx.

ATARI'S FORTUNES are brighter now than they were one year ago as it prepares to offer new versions of its laptop and handheld game units, and says supplies of the units are increasing. During the year, world sales amounted to $550 million, slightly down from 1988's $587 million. Net income was $5.2 million for the year as compared to a loss of $110 million ($1.90 per share) for the year which for ended December 31, 1988.

Queensland CAD Show

PREVIOUSLY AIMED AT AutoCad users, this year's Queensland CAD show is open to all CAD and graphics vendors and users. The venue will be the Brisbane Hilton, May 9 and 10, 1990. Targeted at both existing CAD users and potential purchasers, products on show will include new releases of plotters, scanners and digitisers. Of interest to most CAD users will be the i486, Unix and RISC machines that will be demonstrated.

There will also be demonstrations of CAD and graphics software for architects, draftsmen, landscapers, topographers, mining and civil engineers, and graphic designers.

A wide range of seminars will cover the future of CAD technology and productivity hints for technical graphic computing in business. For more information, contact Debbie Horncastle, QCADS, (07) 839 0411; fax (07) 839 0017. □

The company says the results reflect growth in the Atari ST and Atari PC4 MS Dos-compatible product lines, and in initial shipments of the new handheld Portfolio computer and Lynx handheld color video game machine. The company attributes the total sales decline to slower sales of the traditional video game line, not the Lynx. And European markets were said to outperform all other markets.

Sam Tramiel, president and chief executive officer (and son of founder Jack), said in the press announcement: 'For Atari, 1989 was a transition year. It witnessed the introduction of a new generation of handheld machines, the Lynx and Portfolio, and the disposition of an extraneous business segment. For 1990, Atari is fully committed to regaining market share in the video game sector with products like the Lynx, increasing our market share in the personal computer sector with products like the Atari STE, and maximising our opportunity in the handheld or palmtop computer business with Portfolio.'

One obstacle in the way of maximising opportunity in the video game arena is the slow production of Atari Lynx handheld video game units, analysts noted. Greg Pratt, spokesman for Atari, says the that supply is improving: 'At this point we no longer have the same manufacturing constraints we had previously. We are confident that we will be able to have sufficient productive capacity in place to accommodate the next selling season.'

Short supply of the Lynx was caused by the screens, which come from Japan's Citizen – the company had trouble building up production of the unique screen. While the Lynx was designed in the US, the screen is manufactured in Japan and the complete units are then assembled and shipped to foreign markets from there. □

Adobe for SAA

IBM HAS announced that it intends to provide Adobe Systems' font technology with all of its Systems Application Architecture (SAA) operating systems. These include Operating System/2 (OS/2), Operating System/400 (OS/400), Virtual Machine (VM) and Multiple Virtual Storage (MVS).

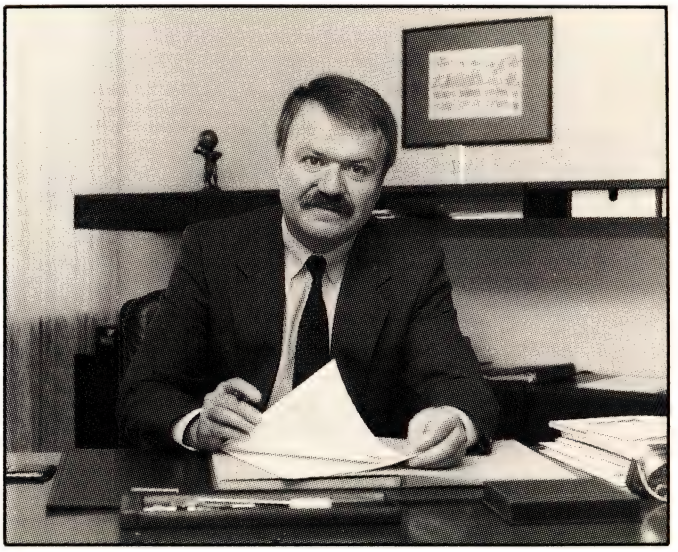
Word of IBM's plans to ship the Adobe Font Technology with its OS/2 product came somewhat as a surprise to many industry watchers and is attributed by securities analysts as the reason for the recent rise Adobe's US stock price.

Much of the surprise comes from the fact that IBM had previously announced plans to ship the Royal font technology, developed by Apple Computer and Microsoft, with its version of OS/2, a move that appeared to close the door on Adobe's chances for inclusion with the product. The open font interface supported by OS 2 allows the support of multiple font technologies and will, therefore, provide users with a choice.

IBM's implementation of Adobe font technology for SAA operating systems will be compatible with the previously announced implementation of Adobe's Display PostScript system for its Unix-based AIX operating system.

In a related development, Microsoft has announced that it will provide the Royal technology, which it has named TrueType, in subsequent releases of Microsoft Windows and OS 2 Presentation Manager. It also announced that its page description language, announced in September 1989, will be call Microsoft TrueImage. □

Dolch comes PAC-ing



Prior to starting his company in the US, Volker Dolch founded Dolch Logic Instruments which became the world's fourth largest manufacturer of logic analysers. He authored several major patents that led to the implementation of the UPC (Universal Product Code) that is familar to most people as the bar coding found on many products. In 1984, Dolch was awarded Germany's most prestigious engineering honor, the Diesel Prize.

VOLKER DOLCH, president of Dolch Computer Systems, spent his time at Sydney's PC90 show showing off his high-end 80486 portable. He took great delight in demonstrating the machine running the Landmark speed test at an AT equivalence of more than 110MHz.

The award-winning PAC (Portable Add-in Computer) series of transportables is available in a variety of configurations, from a 12MHz '286 to the 25MHz i486. Unlike the competition, which is moving towards VGA and color displays, the Dolch machines have monochrome, electroluminescent, double-scan CGA screens, though VGA plasma is an option. □

V.32 stalled

TALKS AIMED at extending the V.32 standard modulation technique for modems, now set at 9,600 and 4,800bps (bits per second), to the higher speeds of 12,200 and 14,400, along with the lower speed of 7,200, stalled in Atlanta over a variety of issues.

When it scheduled the talks at the Atlanta Inforum, Hayes Microcomputer Products negotiator Toby Nixon said he had high hopes for

NEC goes direct

Visitors to NEC's Showcase exhibition were welcomed by a three piece robot band, with the entire display controlled by a computer based on NEC's V70 CPU. NEC could not be persuaded into announcing a release date for the robots, though.

NEC INFORMATION Systems Australia has announced a new sales strategy for large corporate customers. This plan means that the company will be selling computer systems direct to these clients, rather than through the dealer network. NEC Information Systems Australia's general manager, Graeme Poulton, says that this is in response to calls from large customers who are looking for a higher level of after-sales support than many dealers are capable of offering.

One of the problems with the dealer system is that the often fierce competition means that dealers will dramatically discount a product in order to secure a big contract, often leaving themselves with little or no margin over the cost price, so that providing adequate support becomes difficult. By selling direct to these customers, NEC hopes to keep street prices at an acceptable level, thus allowing dealers to maintain sufficient margins to provide adequate after-sales support.

NEC has also presented its strategy to become *the* leading supplier of 'office and enterprise-wide connectivity solutions'. NEC is uniquely positioned to realise this objective,' Poulton said. 'We market everything from laptop computers and printers through to satellite transmission systems and fibre optic networks – all designed and manufactured by NEC.'

NEC has strategic relationships with companies such as Novell, Santa Cruz Operation, and Microsoft (NEC is the second largest customer of Microsoft products), ensuring that the company can offer systems solutions regardless of the customer's preferences for software platform (Dos, Windows, OS/2, or Unix), or hardware.

To give dealers and large customers an idea of the range of NEC products and their capabilities, the announcements were made at the company's annual Showcase exhibition where its latest products are displayed in typical applications.

Released at the same time were several new computer and printer models, including three new Prospeed laptops (one, the Prospeed CSX, includes a color LCD screen), 33MHz '386 and 25MHz i486 additions to its Powermate desktop range, two new laser printers (an HP Laserjet compatible and a Postscript model), and its first color PostScript printer, based on a thermal transfer process. □

agreements, but after the talks, Dr. John Copeland, the firm's vice president-engineering, explained what went wrong: 'There's no agreement yet on the best way to retrain, how the handshake is to be done to decide which speed to operate on, and half-duplex modes. A number of proposals were made, and people took them back for study. The new standard, when it is negotiated, will be called V.32bis rather than V.32, to distinguish it in the market.

'Significantly, they dropped the V.34 idea that got into the press last year. The number, V.34, hadn't been assigned by standards-setters, and the scheme that involved a combination of multi-carrier techniques took the V.34 handle in hopes of exciting the market. □

Germans say Zenith 'number one'

Zenith's Z248 placed ahead of offerings from IBM, Compaq and Commodore to be voted 'number one business machine' by readers of Chip, Germany's prestigious computer magazine.

READERS OF Chip Magazine, West Germany's prestigious computer magazine, have voted the Zenith Z248 as the number one business machine.

Following the Z248 in second place was the IBM PS/2 model 30, closely tracked by Compaq's Deskpro '286. Fourth position was taken by the IBM AT, followed by the Commodore PC-20 and PC-30, and the Tandon PCA. Ninth position is taken by the Apple Macintosh II, which was number one in a survey earlier this year.

On the German home computer front, the Commodore Amiga 500 and the C64 held the top two spots, while Atari's 1040ST and the Schneider PC1 are, respectively, in third and fourth spots. □

Industry Updates provided by Newsbytes, the world's largest network of independent computer journalists.

ADD-ON ATLAS

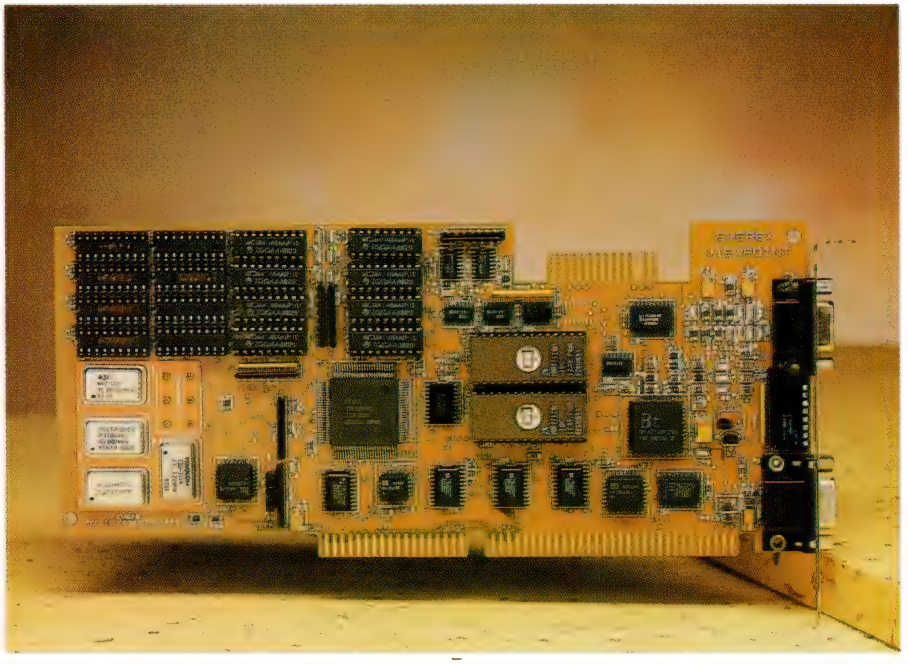
Many people think that by buying a computer, they will have the system they require for years to come. However, more often than not, they soon discover the need for more memory, a bigger hard disk, or a tape backup unit, and the hunt for suitable hardware begins. Mark Cheeseman gives a run-down on the aftermarket market.

ONE OF THE most succesful early (pre-IBM) personal computers was the Apple II, the classic garage creation of 'the two Steves'. This machine was one of the first mass-market personal computers, although its (then) high price tended to restrict it to the serious users. What really made the Apple II the success story that it turned out to be, was its open architecture – under an easily removable lid was a row of edge-connectors, into which all manner of peripherals could be plugged in. The signals on these connectors were clearly documented, so that third-party manufacturers could produce add-on cards to enhance the functionality of the machine.

As a result, an industry sprung up almost overnight, producing add-on cards for the Apple II, from memory expansion cards, co-processors, and a variety of I/O cards. The open-architecture approach meant that the computer wasn't restricted by what the designers perceived to be important when the computer was designed. If a different type of I/O port was required in the future, an add-on card was designed to fit the bill – a complete re-design of the machine was not required.

When IBM released its own PC a few years later, it also used an open architecture approach, with five expansion slots in the original PC, and eight in the XT and AT models. Again, the specifications for these expansion slots were published, thus ensuring third-party manufacturers could produce cards for the machines. However, cards were not the only things third parties manufactured, and pretty soon, the first of the now-familiar plethora of compatible machines began to appear, further expanding the market for add-ons.

Thus was established what is now becoming known as the Industry-Standard Architecture, or ISA, particularly by companies who are promoting the new EISA (Enhanced ISA) bus. In fact, there are two variants on the ISA bus – the original PC



The Everex Viewpoint VGA is typical of many of the enhanced VGA boards on the market, with 256 colors at a resolution of 800 x 600, and 16 colors at 1024 x 768. A 16-bit system bus ensures high speed operation, and a monitor protect feature prevents damage to monitors which cannot display these high resolutions. The board is priced at $395 (excl. tax) for the 256K configuration, and $475 for the full 512K complement. Contact Everex, on (02) 427 6111.

Wyse has two monochrome VGA monitors available, with either amber or white screens. A tilt and swivel base is standard, and they are ideal for applications such as CAD and desktop publishing where a color display is not justified.

and XT one, which had eight data bits and 20 address bits – the same as the 8088 processor used in those machines. When IBM released the AT, it retained the existing XT bus, and added a short addition to the end of it, in addition to some extra interrupt request and DMA (Direct Memory-Access) lines. This AT bus is backward compatible with the old XT variant – XT cards can be plugged into AT slots, but not vice-versa.

For the time being, everyone was happy – the computer manufacturers were selling lots of computers, the card manufacturers were selling cards for them, and the users had a range of machines and peripherals to choose from. However, as processors continued their speed spiral, problems started to arise with slow cards missing the rapid flow of signals from the faster processors. The usual solution to this was to limit the speed of the expansion bus to some level below the real clock speed – usually to 6 or 8MHz, the clock speeds of the first ATs.

But, with processors running at anything up to 33MHz, the I/O bus was becoming a real bottleneck to information flow. Also, the '386 used a 32-bit data bus, which meant that any 32-bit memory accesses had to be processed in two bus cycles to pass them over the 16-bit AT bus. Most '386-based systems offered a special 32-bit memory slot to allow fast access to the main memory, but this still left devices such as disk controllers and network cards to communicate through the bottleneck-ridden AT bus.

The other shortcoming of the XT/AT bus is that it does not allow plug-in cards to take over the bus temporarily – the bus master is always the processor or DMA controller on the motherboard. Add-on boards could only transfer data using one of these devices – they could not access other computer hardware, such as memory and I/O, directly. This meant that the speed of disk accesses and the like is limited by the DMA controller.

Micro Channel

IBM'S ANSWER to these shortcomings was the Micro Channel bus, which allows for multiple bus masters, and also allows several devices to share the few interrupt lines that there are.

There are a few limitations of the Micro Channel bus, when compared to the older AT bus, not the least of which is the smaller size of the new cards. While smaller cards naturally lend themselves to low profile system units, the smaller

amount of board real estate means that for a given level of integration in the components on the card, an AT card can hold much more circuitry than a Micro Channel board.

The variety of cards available for the Micro Channel is not as vast as that for the AT bus. With the Micro Channel being a proprietary architecture, developers are reluctant to develop cards for a relatively small market when the AT bus is still in such widespread use. Also, the amount of work required to develop a Micro Channel card is much more than that needed to develop a similar board for an AT, due to the switchless setup of the new technology. The combination of these two factors means that many developers are simply not interested in all the extra work for a relatively small section of the market.

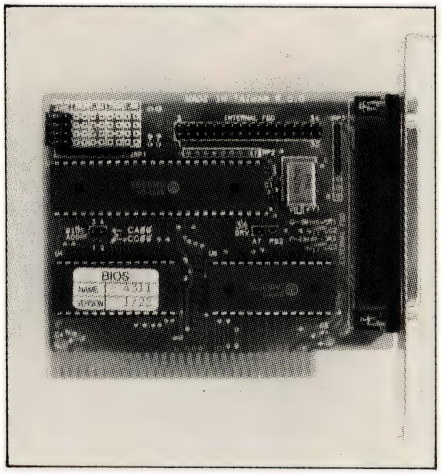
While some manufacturers have licenced the Micro Channel technology from IBM, a group of the leading clone manufacturers has established an alternative standard, called EISA (Enhanced Industry-Standard Architecture). This standard is an extension of the ISA bus used in XT and AT machines, offering 32-bit data paths, bus mastering and software configuration.

Just as the AT bus extended the functionality of the XT bus by means of an extension to the latter's bus, the EISA bus extends the ISA bus through a similar technique. However, the extra pins in the EISA bus are placed *below* the old AT pins, and the cards plug into a special 'double-decker' edge-connector on the motherboard. Existing XT and AT cards can also be plugged into the new bus – their pins mate only with the top row of contacts in the EISA connector, and the lower set of contacts remain unconnected. This backward compatibility with older cards, is a major plus for the EISA system, and has the added bonus that EISA cards, being of the same physical dimensions as ISA cards, can hold more circuitry than a Micro Channel card.

Of course, the range of peripherals available for a computer is not restricted to devices which can plug into the expansion bus. General-purpose serial and parallel ports also offer a wide range of expansion possibilities, and on some machines (such as older Macs and some PC clones) these are the only means of expansion available.

Video options

RIGHT FROM the outset, the IBM PC was destined to have a variety of video standards – the original PC had two video options, a monochrome text-only card (the MDA), and a low-resolution color board, called the CGA. There was no perceived market for high resolution graphics, either monochrome or color.



A multi-format floppy controller, such as this one from PC Marketplace, (02) 418 6711, can control any current type of PC drive, either internal or external, and some models can co-exist with an existing controller, for up to four floppy drives in total.

However, there certainly *was* a demand for such graphics capabilities, for applications such as graphing in spreadsheets and CAD. The release of the EGA adaptor satisfied this section of the market, offering high resolution (640 *x* 350) graphics in 64 colors, 16 of which could be displayed simultaneously.

More recently, the VGA appeared, offering 256K colors, of which 256 could be displayed simultaneously. To achieve this level of color rendition, the VGA uses analog monitors, which allow a virtually limitless range of color hues to be displayed (this is not strictly true, but neither is it true of color television, but nobody seems to notice that some colors simply *cannot* be reproduced accurately). VGA can also be connected to monochrome analog monitors, for applications where color display is not required. This configuration still gives high-resolution graphics, and 64 grey-scale levels can be displayed on the monitor.

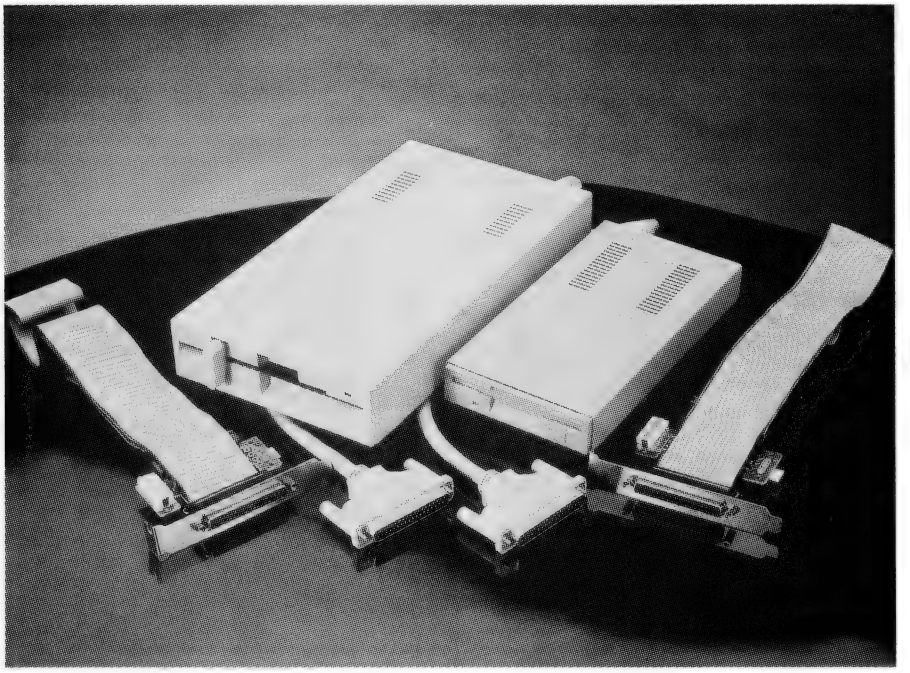
VGA also has another advantage for applications such as CAD and desktop publishing – its aspect ratio. All IBM video boards before the VGA had pixels which were larger in one direction than the other, so a 'square' with an equal number of pixels per side would actually appear rectangular on the screen. This meant that anything which was to be displayed on the screen had to be scaled differently on the vertical and horizontal axes if it was to appear in its correct proportions. Some software bypassed this scaling step, with the result that objects appeared distorted on screen, and their true proportions often remained a mystery until such time as they were printed out.

One of the few non-IBM standards in the PC world is the Hercules monochrome video card. Highlighting the lack of a monochrome graphics card in the IBM lineup, Hercules created a monochrome card which was fully compatible with the IBM monochrome text modes, but with the added benefit of bit-mapped graphics. Like all the IBM video cards, the Hercules card has been faithfully reproduced by the hordes of clone manufacturers. Despite the popularity of the Hercules card as a monochrome graphics standard, IBM refuses to acknowledge its presence, and didn't incorporate any Hercules-compatible modes in the VGA. The VGA is now the standard video platform for all '286 and '386 PCs in IBM's lineup, and the small price difference between an EGA card and monitor, and one for VGA, makes specifying the former hard to justify.

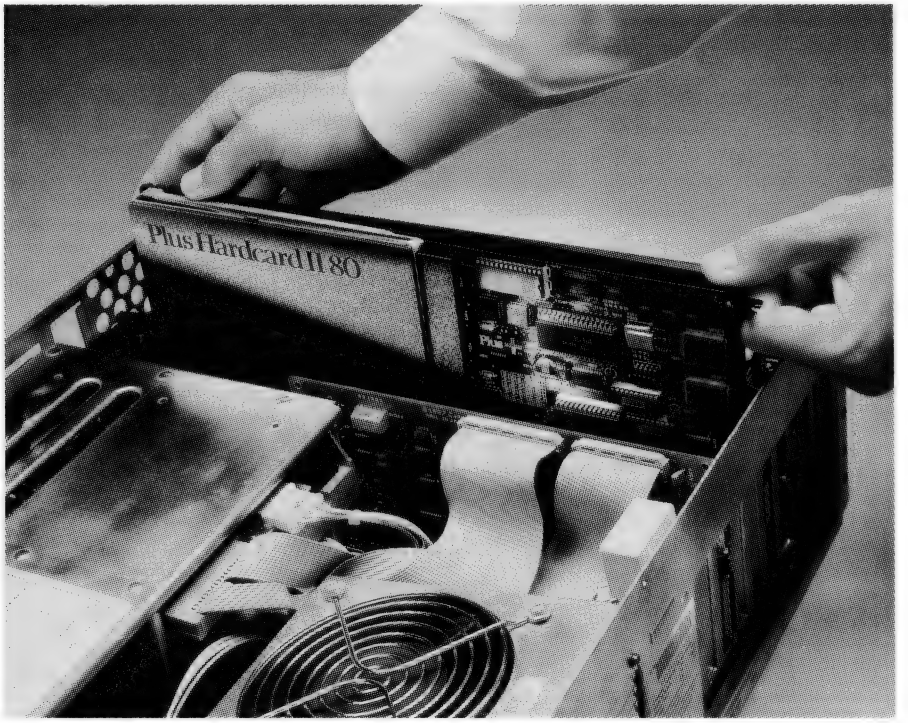
And, if 640 *x* 480 pixels is not enough resolution, many VGA manufacturers are supporting the SuperVGA standard, which offers 800 *x* 600 dot resolution on a suitable monitor, and some VGA cards go as far as 1024 *x* 768, although a monitor capable of displaying this sort of resolution does not come cheap. In addition, many VGA cards can display 256 colors in the 640 *x* 480 mode, rather than the standard 16, and some can even display this many colors in SuperVGA mode.

Mass storage

DISK DRIVES are one of the most popular add-ons for PC compatibles, due in no small part to the plethora of different floppy formats supported – at last count there were no less than seven different floppy standards supported by PCs, from the original 360K single-sided double density format right up to the 1.44Mb double-sided high density 3½ inch numbers. Extra density (ED) drives and media are just starting to come onto the market, and with double the storage capacity of high



Roctec manufactures a wide range of external floppy drives for a variety of computers, including the Amiga, the Amstrad range, Toshiba and Zenith Laptops, and the Apple II series and the Mac. For more information, contact PC Marketplace, 418 6711.



The Plus Hardcard II offers 40 or 80Mb of disk storage for AT style computers, with an average access time of 19ms. The Hardcard II 80 is currently on special at $1495 (incl. tax), which is less than the recommended retail price for the 40Mb unit. For XT machines, the Hardcard is available in 20 and 40Mb sizes, starting at $1145 incl. tax. Contact Tech Pacific, on (02) 697 7111, for more details.

density floppies, are bound to appear in PC systems before too long.

The original PC and XT controller could handle four drives of 360K capacity each – two internal and two external. Most stand-alone clone floppy controllers have similar specifications, although those incorporated into 'multifunction' cards tend to only be capable of controlling two drives. If you want to add higher-density floppy drives to your XT, then one of the new multi-format cards would be a wise investment, allowing any of the standard PC drive formats to be utilised.

AT-style machines typically have the floppy controller on the same card as the hard disk controller, but since high-density disk formats are already supported, replacement is not usually necessary (unless you want to use a different type of hard disk, which we'll get to later).

A hard disk was considered a luxury when the first PC hit the market, so mass storage was limited to floppy disks. When the PC/XT hit the market some time later with its enormous 10Mb hard disk, computer users wondered what they'd do with all that space. Nowadays, 20Mb is the standard 'entry-level' hard disk, with capacities of over 700Mb available in modern full-height drives.

When adding a hard disk to a computer which doesn't have one, there are several physical parameters to look at before going out and deciding on one to buy. The first of these is the capacity of the power supply, which in the first PC model from IBM was a rather paltry 63 watts. Most modern machines have a supply with at least a 150W rating, and if yours falls into this category, the addition of a hard disk should not present any major problems. If, however, you have one of the old 63W jobs, an upgrade is highly recommended, and any of the standard PC or XT form-factor supplies should do the job.

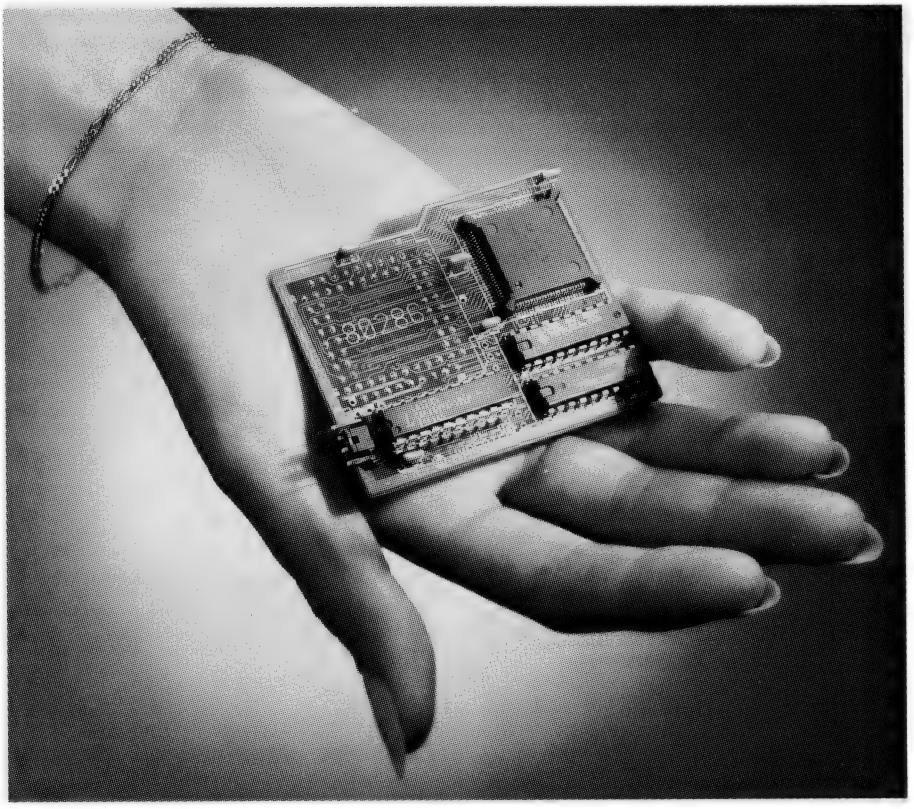
The other, rather obvious, thing to check before adding a hard disk, is that there is a spare drive bay for it. If you have an unusually large number of floppy drives in your system, or already have a hard disk, there may not be any room left for another drive. Fortunately, there is a simple way around this – the hard card. In fact, installation of a hard card is so much simpler than a drive and separate controller, that many users install one simply to save time and trouble.

Hard cards are a full-length expansion card with a 3½ inch hard disk drive mounted on it. Early hard cards were rather bulky, and the drives tended to spill

over into the adjacent expansion slot. However, with the reduction in size of these drives, driven in no small part to the rapidly increasing popularity of laptops, a modern hard card with up to 80Mb of storage space is possible in a single slot.

Information is stored on most hard disks (and indeed floppies) using a method known as modified frequency modulation, or MFM. However, if the spindle speed of a drive can be accurately controlled, it is possible to use a more efficient means of encoding the data, called run-length limited (RLL) encoding. This provides a 50 per cent increase in storage capacity for a given drive, and a similar increase in data transfer rate. While any drive can be connected to an RLL controller, and will probably work, it is a good idea to buy a drive which is specified for RLL, as they are usually manufactured to tigher quality-control specifications than MFM drives. If you use an MFM drive with an RLL controller, and it fails later, the drive manufacturer could be reluctant to exchange it under warranty.

For increased storage capacity and performance, a SCSI or ESDI drive and controller board would be a good choice. Both of these systems put some of the functionality usually found on the controller in the drive itself. This means that the small signals recovered from the surface of the drive don't have as far to travel before being detected. In addition, SCSI is a bus system, able to control up to seven



If a motherboard transplant seems a little daunting, then the Hyper '386SX board from Hypertec is a simple way for '286 users to upgrade to a '386SX. The CPU chip is simply removed, and the small daughterboard is plugged in its place. The SX runs at the original clock speed of the computer, so there is no speed improvement, but you can then run '386 specific software such as Windows/386 or DESQview. The board is priced at $795 (incl. tax), and Hypertec can be contacted on (02) 816 1211.

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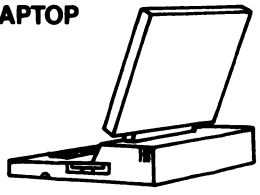

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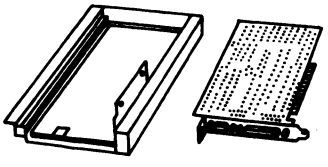

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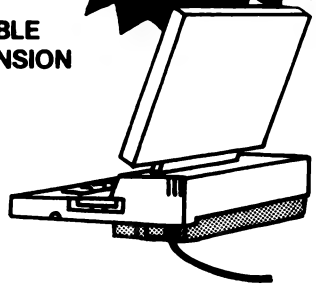

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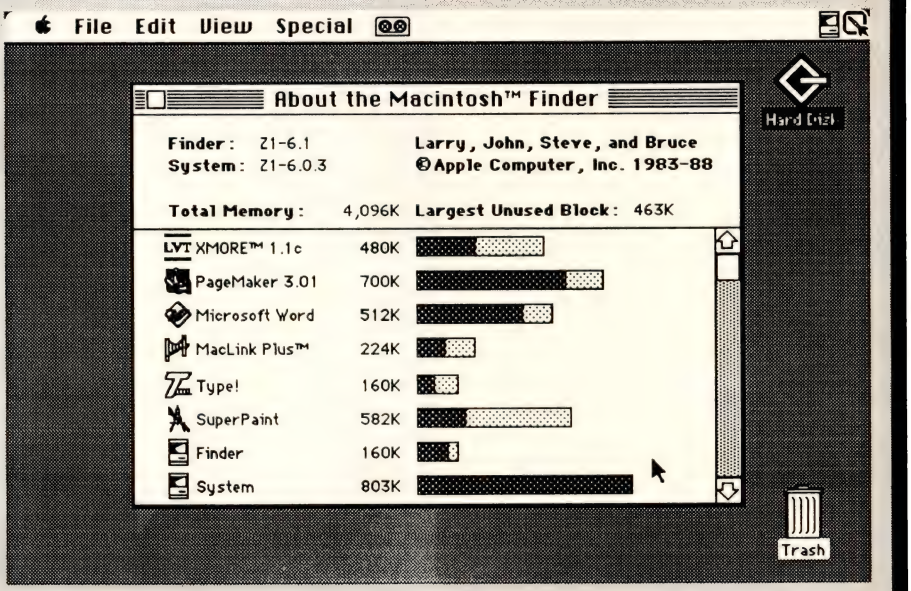
Virtually RAM

Pierre Cochrane ogles an alternative to adding memory to your Mac – virtual memory.



VIRTUAL, A virtual memory system for Macintosh computer operating systems, was first released by Keyway Computers in mid-1989, and was dropped because it was accident prone. Performance Sales then picked it up because it needed a way to support Omnipage's omnivorous appetite for memory.

While Virtual v1 was an obnoxious oaf causing no end of system bombs, it was also a portend of good. Virtual v2, which was released late last year, has proved an outstanding obbligato.

Any truthful reviewer writing about v1 would have been obliged to orate an obituary. All the bugs, CDEV hassles and pain which ossified v1 and made it so obdurate, have been ostracised and now it is an obedient and oh so nice, compliant and co-operative, if somewhat obscure, object.

The advantage of Virtual v2 is that it gives you omnipotent power over your computer's memory size regardless of the amount of physical RAM installed. If you want to, you can have an obese 14.336Mb virtual memory size allocated and your Mac operating system will oblige. I have run Virtual v2 since mid-December, allocating a maximum memory size of 8Mb without being obsequious about it.

Virtual is an initialiser, which moves the Mac's memory space out on to the hard disk, then it creates a very fast intelligent hardware disk cache in RAM, to implement a demand-paged virtual memory system.

Virtual memory has been used for many years on mainframe and minicomputers, but this is the first time this technology has been made available for the Macintosh. The net benefit to the user is that Virtual expands the Mac's memory to 14Mb, the maximum amount currently allowed by System 6, at a fraction of the cost of expensive DRAM SiMMs.

A Virtual upgrade gives you access to the most advanced programs available and the capacity to use them. It allows you to run the latest software on your expanded Mac, or using Apple's MultiFinder, run two or more of your favorite programs simultaneously. Additionally, it gives you more work space for each program, especially large databases, spreadsheets, CAD, MIDI and scanning applications.

Given a sufficiently fast hard disk, virtual memory performance can approach that of DRAM for many types of applications. Virtual uses *demand paging* which means it will effectively load up only those sections of an application you use. The first time you use a new function or pull down a menu, there may be a brief pause while the code from that function is loaded. But thereafter, any subsequent use should find the code already loaded and ready for execution. Virtual will keep just those sections of program code you most need and use in memory.

To run Virtual, you will need an A/UX machine, a Mac IIx, SE/30, or any Macintosh with a 68030 CPU. This is because the Paged Memory Management Unit (PMMU) is an integral part of Motorola's new processor design, and all of the processor hardware required is already incorporated into these new generation CPUs.

If you have a Macintosh II you will have to fit it with a Motorola MC68851 PMMU co-processor, which is supplied with the Macintosh II version. Once the hardware is in place, installation is simply a matter of dragging the Virtual icon into the System Folder.

In a recent announcement entitled System Software Directions, Apple announced that virtual memory and full 32-bit addressing and core technologies under development for inclusion in their next major Macintosh System Software release, System 7.0.

When this release comes along, the current RAM limit imposed by System 6, will be replaced by limits of 128Mb of physical RAM and Gigabytes (1000Mb), of virtual address space. Virtual will then give you up to a full Gigabyte of virtual memory capability, or at least as much hard disk space as you can afford.

For further information, contact Performance Sales, (02) 906 4900.

storage devices via a single cable, which is a decided advantage for large file servers (provided you've got the space to put all those drives).

With the increasing emphasis on data security in today's office environment, not to mention the ever-present threat of viruses, being able to remove data and safely lock it away from prying eyes (or the occasional fire) is becoming more attractive all the time. Removable mass storage is nothing new – mainframes used removable disk packs in drives which bore an uncanny resemblance to domestic washing machines.

One of the first removable mass storage devices released for PCs was the Iomega Bernoulli box. These are currently available in two sizes – 20 and 40Mb, and can be mounted either internally or externally, and can be added to XT or AT compat-

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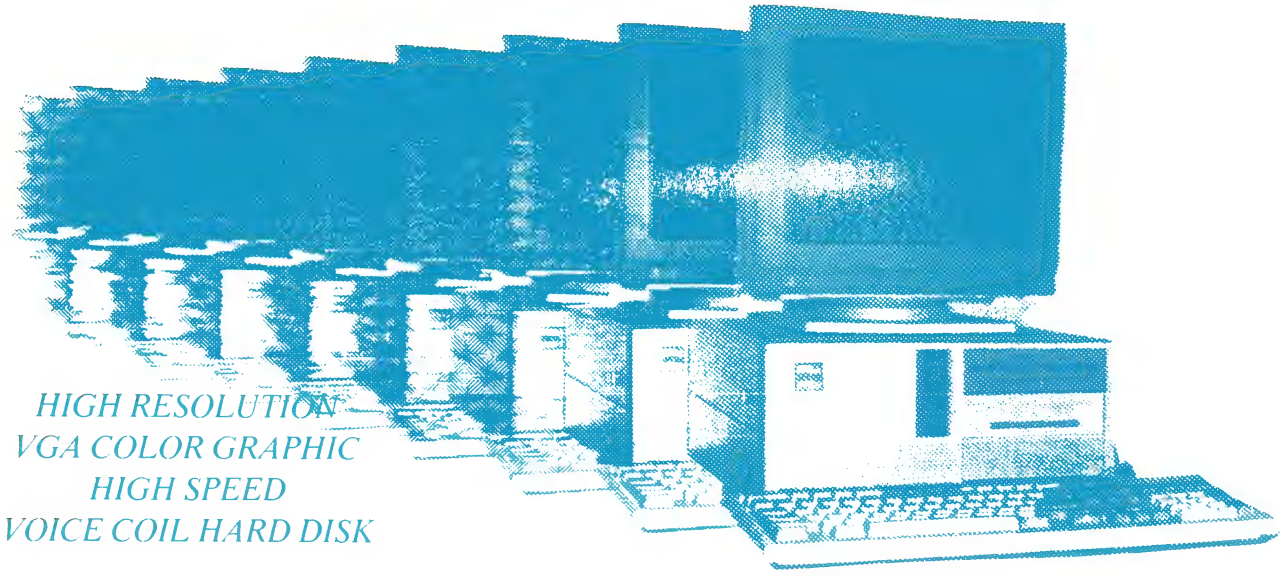

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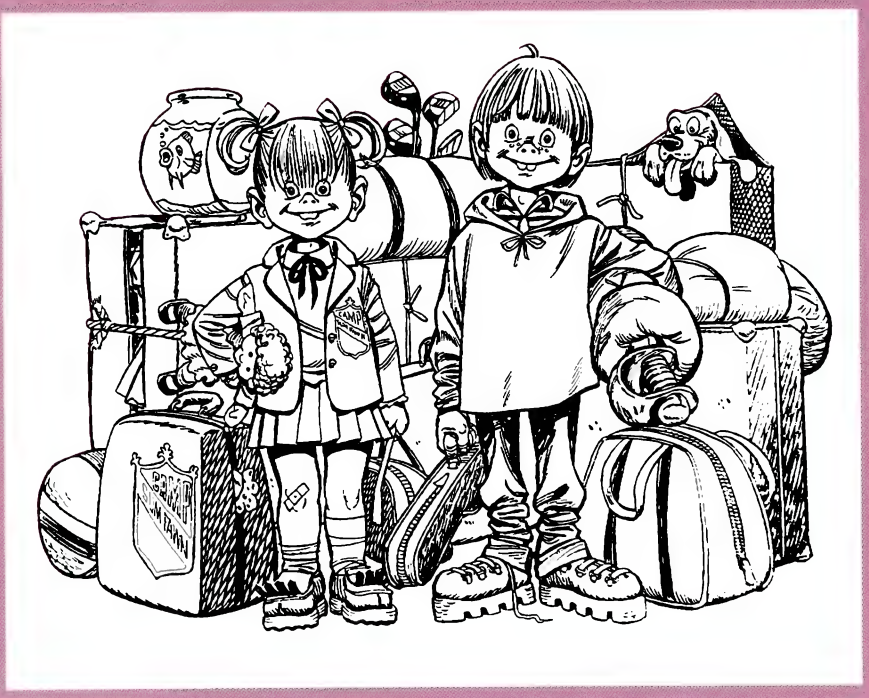
FaxScan

MOST OFFICES today have a fax machine – the immediacy of the phone network combined with the convenience of being able to send written messages without using a keyboard means that the fax machine has all but replaced telex machines in most offices, and given fax a popularity (especially in Australia) which far exceeds any previous hard-copy communications medium.

All fax machines have a built-in scanner that is necessary to convert original documents into a digital data stream for sending through the telephone system. Some fax machines also make this data available in unmodulated form, via a socket on the rear of the machine.

Advanced Solutions has developed an adapter and driver software which allows an Oki fax machine to be used as a scanner for input to a PC. Plugging FaxScan into one of the serial ports on the back of a suitable fax machine (Oki OF-10, -17, -23, -27, -38, -110), and a parallel printer port on an IBM PC or compatible allows pages of up to A3 size to be scanned at up to 200 *x* 400dpi, and saved as a standard TIFF file. This file can then be read in by most desktop publishing (DTP) and graphics packages.

We tried out an early prototype unit, and were more than impressed by the results. With a resolution of 200dpi in one direction, the specifications may not look as good on paper as those of one of the popular handheld scanners, but the results which we obtained from a fax machine and FaxScan were better than any 'handy-scanner' we've used, regardless of resolution. The reason, as anybody who has used a handy scanner will verify, is simple – it is difficult to keep these scanners in a straight line, especially over a long distance. This means that any straight lines appear quite bent, and lines which run in the direction of the scan, or perpendicular to it, are very difficult to scan correctly.



Even with flat bed scanners, it usually takes several attempts to align the original on the glass surface before satisfactory results are obtained. Fax machines have a decided advantage here – they have an adjustable paper guide which can be adjusted to the exact width of the document being scanned, so that it feeds into the machine in the right direction.

Another advantage of using a fax machine is that many such devices are capable of scanning documents up to A3 size, which only the more expensive desktop scanners can do. Even if the final image will be only a fraction of that size, the resolution will be increased by the amount by which the image has been scaled down.

The operation of the fax machine is not disturbed in any way. Setting up involves enabling the *data dump* mode of the fax machine, a normally undocumented feature which is explained clearly in the FaxScan manual. When not being used in its new role as an image scanner, the fax machine can still send and receive faxes in the normal way. If an incoming call arrives during a scanning operation, the call will simply not be answered. The machine sending the fax will usually re-dial the number after a short delay, at which time the scanning operation has hopefully been completed.

FaxScan is anticipated to be priced at $299 (including tax), and further details can be obtained from Advanced Solutions, (02) 872 1981.

ibles, PS/2s, and the Mac range. The disks are contained in small cartridges about the size of a compact disk cover, and the avarage access time of the 40Mb unit is 32ms.

For really large amounts of removable storage, Canon will shortly be releasing their magneto-optical subsystem, which can store 256Mb on each side of its 130mm diameter platter. It can be connected to a Mac via its SCSI port, or a PC using an optional SCSI host adapter board. This drive is the one used in the NeXT workstation, and Canon anticipate that it will be shipping around June or July. Estimated cost will be somewhere in the vicinity of $7000 (including tax), with the disks costing under $400 each.

Where it is not possible, or even desired, that the data be physically removed from the computer, but simply backed up from time to time, then a tape drive should solve the problem. These may be either internally or externally mounted, depending upon the requirements of the particular application. Internal drives mount in a standard half-height drive bay, and because they do not need their own enclosure or power supply, they are significantly cheaper than external devices. One advantage of an external drive is that controller cards can be purchased for several computers, and a single drive moved between them to backup the various hard disks. However, in these cases networking can be a better solution, allowing file and printer sharing as well as centralised backup. Capacities of both internal and external drives range from 40Mb up to 250Mb, and the drives use one of two standard tape cartridge sizes.

Tape drives can either be controlled by

the existing floppy controller, or by a special-purpose controller supplied with the drive itself. The latter method is naturally more expensive, but results in faster transfer rates to and from the tape.

More memory

THE FACT that Dos can only address 640K of RAM does not seem to be any great impediment to manufacturers of memory boards and RAM chips, with many PCs sporting 2, 4, or even more megabytes of RAM on their system boards and expansion cards. Before going into the intricacies of memory expansion boards, it is a good idea to recap the various types of memory available for the PC. Conventional memory is the most basic of all, and refers to the RAM located between the bottom of the memory map (address 0) and the 640K level – the area originally defined by IBM as the place where all system RAM should reside. The rest of the address range of the 8088 processor (up to the 1Mb boundary) is set aside for video RAM and ROM, with some space free.

To provide more space for large amounts of data without needing to swap to and from disk, Lotus, Intel and Microsoft collectively defined a standard to allow the 8088 to address more memory than 640K. The resulting standard, known as *expanded memory*, or EMS, allowed up to 8Mb of extra RAM to be added to a system, and accessed in lots of 16K through a technique called bank switching, where selected 16K blocks of this memory are mapped to unused areas between the top of conventional memory and the top of the processor's address range. A later revision of EMS (version 4.0) increased the amount of memory which could be accessed in this way to 32Mb.

If you use an MFM drive with an RLL controller, and it fails later, the drive manufacturer could be reluctant to exchange it under warranty.

The third type of PC memory is *extended memory*, which only exists on '286 and later systems. This is memory which starts at the 1Mb boundary and continues up to the limit of the processor. Since on the 8088 these two limits are one and the same, extended memory is not a possibility on machines based around this processor.

Even '286 based machines have trouble accessing extended memory. The extra memory can only be accessed when the processor is in *protected mode*, but normal Dos operations function can only take place in *real mode*, that mode which emulates the 8088. However, once any operations on extended memory are completed, the processor must return to real mode before execution of the Dos program can continue. Due to a design oversight on the part of Intel, the '286 does not have an instruction to return to real mode from protected mode. To get around this, ATs have special hardware to reset the processor, and 'catch' it before the system re-boots and sends it to the point in the program

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A tape drive is a necessity if you are to back up a hard disk without sitting around feeding in floppies for an hour or more. The Retriever 60 from Alloy backs up 60Mb of data, or up to 120Mb with data compression, on industry-standard QIC-40 tape cartridges, at a rate of 2.4Mb per minute. The drives are very quiet in operation, include easy-to-use backup software, and are available as either an internal or external drive. The external unit here has a taxed price of $1345, and more information can be obtained from Alloy, on (03) 561 4988.

where it left off. This incurs a significant speed penalty, although a RAM disk implemented in extended memory is still better than even the fastest hard disk.

The other problem with extended memory is that, unlike EMS, there is no standard way of allocating memory to various tasks. If a RAM disk is installed to take up, say, 1Mb of expanded memory out of an available 2Mb, other software cannot reliably tell how much memory is still available for its own use. For these reasons, most PC software uses EMS rather than extended memory, although there are notable exceptions, such as Lotus 1-2-3 release 3.0 and OS/2, the latter running as it does in protected mode.

With the '386, Intel finally got the mode switching under control, and also introduced the virtual 8086 mode, where the processor could function as several independent 8086 processors, under the auspices of the '386 protected mode, to manage common system resources. Multitasking operating systems such as Quarterdeck's DESQview and Windows/386 from Microsoft use this mode of the processor to allow multiple Dos applications to be executed simultaneously.

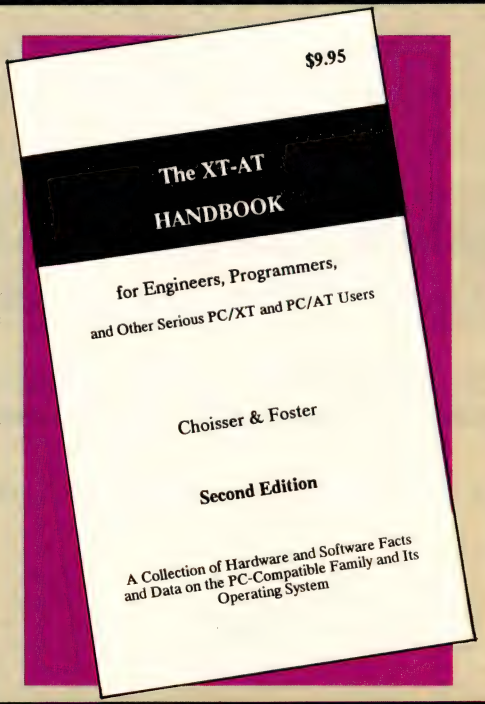
Both of these multitasking operating systems use expanded memory, which can

Handbook for hardware hackers

IF YOU'RE serious about adding things onto computers, then you really need to know a bit more about the PC hardware than is supplied in most computer user's manuals. This is especially true if you are called upon to look after several different machines, or add unusual or non-standard peripherals to them.

The *XT-AT Handbook* by Choisser and Foster is a pocket sized book, so that it is always on-hand. Its 68 pages contain most of the information relating to the hardware and BIOS of PC, XT and AT type machines, although the treatment is not as detailed as would be found in proper technical manuals, but if you don't have a technical manual, it certainly gives more information than most people need anyhow.

Included is an extensive table of diagnostic error codes generated by the BIOS during the power-up sequence. Pin-outs for the expansion bus are listed, with a brief explanation of the functions of all the control signals. Pin-outs for all the common I/O connectors are also listed, including keyboard, games,



parallel and both types of serial ports. Video pin-outs are provided for monochrome (and Hercules), CGA, EGA and VGA ports.

A complete I/O map (including all three parallel and four serial ports, which many tables leave out), memory map, and listing of software and hardware interrupt assignments is accompanied by a complete functional listing of XT DIP switches and the AT CMOS setup RAM, including a listing of the usual hard disk drive type assignments. It even describes how to find the BIOS drive type table itself, if you ever want to install a custom type of drive.

Other tables included are keyboard scan codes for the three types of keyboard, an extended ASCII character set, and a brief summary of Dos commands and their options. Similar lists for Debug, Edlin, and Config.sys save you running to the Dos manual when you can't remember a command.

Our copy came from Wordwise, PO Box 884, Hamilton, New Zealand, and is priced at $A25 or $NZ25, including airmail postage and handling.

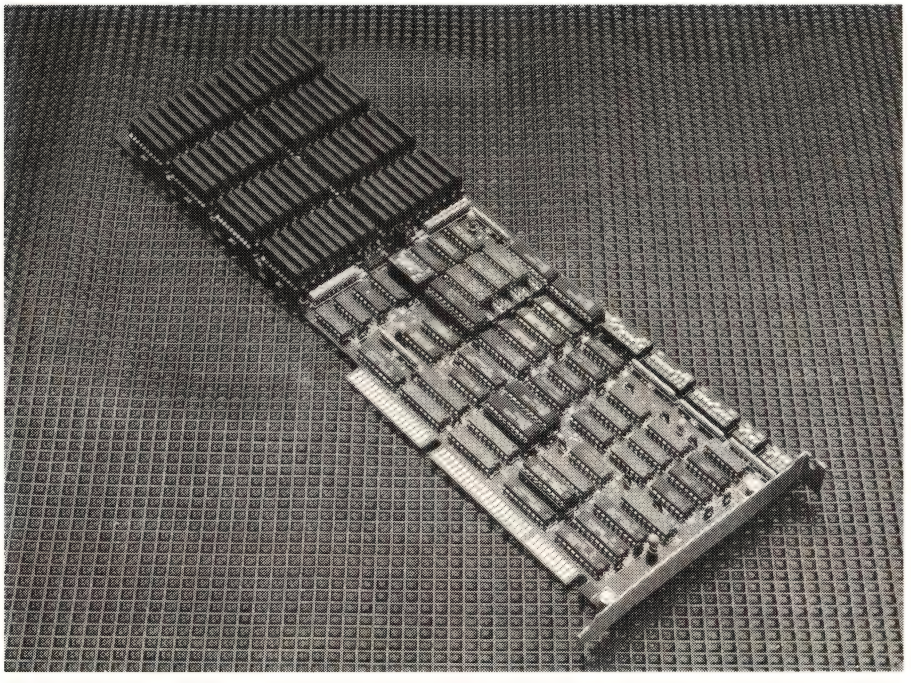
be emulated efficiently on a '386 in software, using the large amounts of extended memory which that processor can address. EMS can also be emulated in extended memory on a '286, although the aforementioned speed penalty which applies to '286 extended memory applies here too. One such product is Softbytes, which emulates EMS 4.0 in extended memory or on a hard disk. This is available from Software Express, (03) 663 6580. For more information, see Stewart Fist's article on page 32.

On different types of memory, if you have an 8088-based system, then the choice is simple – expanded memory. Boards are available from a wide variety of manufacturers, and can be purchased with the full complement of memory, no memory at all, or somewhere in between. Most boards are populated using standard DIP chips, although single-inline memory modules, or SIMMs, are becoming more popular.

If you want to add EMS memory to an AT, then be sure to purchase a board with a full 16-bit AT bus, otherwise the memory access speed will be restricted to that of an 8-bit system. Also try to match the speed of the memory chips to those in the rest of the system, to ensure best performance. The specifications for the board will tell you what clock speeds the board is capable of operating at.

Only add extended memory to a '286 if you have a specific reason for doing so, such as the desire to run OS/2 (or Lotus 1-2-3 release 3). If your motherboard only has 640K of memory on it, it is usually possible to expand this to at least 1Mb by exchanging some of the RAM chips for higher capacity ones. More recent systems allow for up to 4Mb on board, by using the newer 1Mb chips. Most expanded memory boards can also be switched to operate as extended memory, if you can't fit any more memory on the motherboard. They can also make up for any shortfall in conventional memory, if your system has less than 640K (known as *backfilling*).

On a '386, the best bet is to put as much expansion memory on the motherboard as possible. Most '386 systems have a special 32-bit slot, which allows extra memory to be accessed as fast as possible, without being restricted to the 16 bit data path of the AT expansion slots. All of this memory, whether on the motherboard or the special expansion card, appears as extended memory, which can then be managed by EMS-emulating software such as Quarterdeck's QEMM.



The Hyperam '286 from Hypertec supplies up to 8Mb of extended or expanded memory for XTs, ATs, and the PS/2 Model 30-286. Hypertec manufactures a range of memory boards for PC XTs, ATs and Micro Channel machines, and all are designed and manufactured in Australia.

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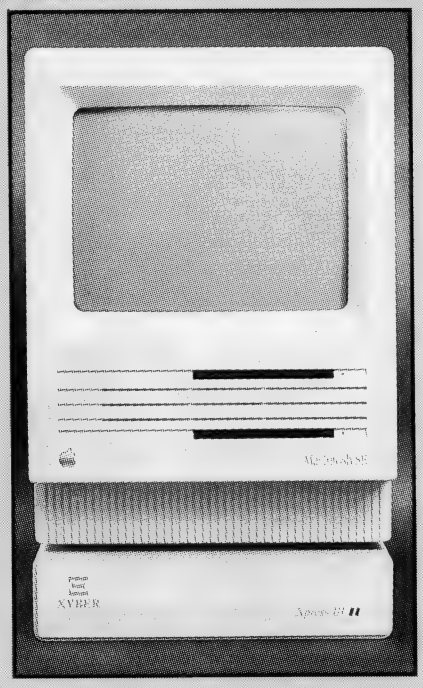


EARLY IN March, Australian Manufacturer of Macintosh peripherals Xyber, announced the release of a new product which has several unique features that set it apart from run-of-the-mill mass storage devices.

The exciting thing about Xyber's new product, is that it's not just a new ho-hum box, but a new concept and that's rare amongst the me-too crowd who clutter up the peripherals market. The new Xyber drive is known as a Safety Hard Disk – a device that will be an impregnable vault for your data.

The Safety Hard Disk is lockable. A sophisticated barrel lock on the box will keep trespassers out. The drive is nearly unbreakable because it has three levels of shock absorption built in, and can withstand real shocks, rough transport and the kind of treatment that would send ordinary drives into the never-never.

To protect the integrity of your data, the software drivers intercept emerging bad sectors before they turn into hard disk errors and make a file unreadable. It won't even burn out, the universal power supply withstands over-voltages and brownouts that would send most other drives into the service department. (It automatically adapts to mains voltages between 90 and 270v, 50/60Hz).

These design features mean that the Safety Drive can be used as a pick-up-and-go hard disk drive. Rather than lug a Mac between home and office, use the Xyber drive as a portable data pack.

Because of the Xyber drive's in-built security features, you can plug your drive into a Mac in any strange environment and be confident that you are totally in control of who has access to the data that's on it.

The Safety Drive will be a boon to any Mac professional with personal or confidential documents on their hard drive; to field auditors visiting clients; to bureau operators whose Macs are open to public scrutiny, to anyone who uses Macs in a shared environment.

Xyber is an Australian company that has been manufacturing Macintosh peripherals since 1985 – an eternity in this industry. The company was founded by Plamen Pazov, an electronics designer with degrees from Paris and London; in response to the lack of technical expertise and unrealistic prices faced by Macintosh users at that time.

'In 1985 I was working on the design for a MS-Dos hard disk for a local company. The Mac had just been released, it looked like a fun machine and was enjoyable to use. I had to decide if my future lay in the Mac or PC worlds,' Pazov said.

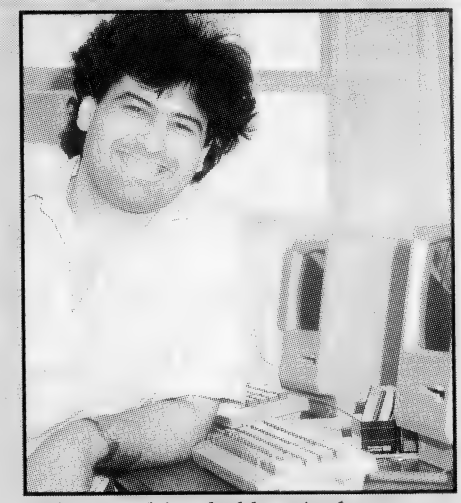
'Apple Australia made that decision easy for me. They adopted a policy of limiting their dealers to Level 1 service. This effectively means board exchange. Any repairs more difficult than this sees the defective parts go overseas for service.

'The net result was that many service technicians didn't really understand what was going on inside the computers they were trying to fix. It wasn't the technician's fault, all they received by way of training was a three day course which covered just the basics.

'Mac users were screaming for a local, quality service centre staffed by people who had a real understanding of what they were doing. This is how Xyber started.'

As well as repairing defective machines Xyber, started designing and manufacturing their own products for the Mac. 'Our first product developed for 128K Macs was a 512K memory up-grade.

'The Mac is a graphics computer and by definition more memory-hungry than a text based PC. It is therefore axiomatic that the more memory in the machine, the better it performs. At that time, Apple was selling a board up-grade with only a three month warranty. Our up-grade was significantly less expensive and included



'When our drives had been in the market for 12 months, we were so satisfied with their reliability and performance that we gave all Xyber drive owners a Christmas present. We announced in the press that we were retrospectively extending the duration of our warranty to two years. I believe this to be a very rare occurrence in the annals of user support history in Australia.' ***– Plamen Pazov, founder of Xyber.***

Other add-ons

MOST PCs come with at least one parallel port, and one or two serial ports, and many people do not need any more than this. However, Dos can address up to three parallel ports and four serial ports, and some software can handle eight or more ports, by using custom drivers or bypassing Dos entirely for serial I/O operations. If your system has a single serial port, chances are that it has the logical device name COM1, and if there are two ports, they would be COM1 and COM2. Most I/O cards have provision for an optional second serial port, which is enabled by plugging in the required chips and an extra connector. Check with the supplier of the board about how to upgrade to the second serial port.

If you already have two ports, and want more, a second I/O card will be necessary. Just make sure that before installing it that the addresses of its ports do not clash with those already installed. The card may also have a parallel port, so ensure that its address is different from any other parallel port in the system.

a two year warranty.'

Xyber grew quickly. Not only had they developed a good reputation for service, but they were starting to get a good reputation for the growing number of Mac products they were manufacturing.

When Apple released the MacPlus, suddenly every Mac user wanted an 800K. floppy drive. Xyber's next product was an external 800K floppy disk drive which sold for just under $500.

It was obvious to Pazov that as the performance and range of Apples' Macintosh computers improved there would be an increasing need for mass storage devices. Having already designed hard disk drives for Dos machines, he developed a 20Mb drive for the Mac. This was followed by 30-, 40- and 70Mb drives, all of which became successful additions to Xyber's product range.

Xyber's second generation range of hard disk drives, the Xpress/2 Series, included both internal and external high speed hard disks which used highly reliable industrial-grade hard disk units. Sizes ranged from 40Mb to 100Mb models, and all models were backed up by Xyber's unique support.

The company's reputation for excellence amongst a fairly large Mac user base supports their claim that they do know what they are talking about. Nearly half of their employees are involved in research and development, and they just keep on improving their products. This is how the latest Series III – The Safety Drives – family came to be.

The Xpress III Series features moving coil positioners with automatic parking and locking of the heads, intelligent look-ahead data caches, automatic error detection and correction, transparent bad sector reallocation, one to one sector interleave, one to one vertical interleave, and many more. The list of advanced features goes on and on.

You might expect to pay a premium for the security features of the Xyber's III Series Safety Drive, but this is not the case. Recommended retail prices start at $1239 for a 20Mb unit up to $2448 for a 100Mb drive.

The port assignments for parallel ports are a little confusing at first, since the logical Dos names (LPT1 to 3) are assigned when the system boots up. Dos starts at the highest parallel port address, and then descendes to the other possible port addresses, checking at each location for the presence of a port. The first port which it finds is assigned the name LPT1, the second LPT2, and so on. This means that any computer with a parallel port will have a logical device called LPT1. If you subsequently add a second parallel port, it will assume the name LPT1 if its address is higher than the existing port. So, if your printer stops working after adding a new port, try plugging it into the new socket – the logical assignment of ports could have changed as a result of the upgrade. If it still doesn't work, check the addresses of the two ports, they might be the same.

This applies to any upgrade – memory or I/O. If a new device occupies the same address as an existing one, they will conflict with one another, and the likely result is that either the new device won't work, or the system will fail to boot, or will hang some time later.

If you want to speed up your computer without the expense of buying a new machine, then a motherboard upgrade might be the answer. High speed '286 and '386 motherboards are available from a variety of sources, and in most cases they are simply a drop-in replacement for the existing board. While replacing a motherboard is a more involved undertaking than installing an expansion card, requiring the removal of all expansion cards in the system, and possibly the power supply as well, it is more tedious than difficult. Boards using the '386SX processor are also rather popular, costing less than a true 32-bit '386. You can also get '386SX daughterboards, which plug into the '286 CPU socket on existing motherboards, to allow the running of '386-specific software.

Of course, changing the motherboard is a pretty major undertaking in terms of financial outlay, and it would be wise to examine the cost of buying an entirely new system. For starters, you are guaranteed that it will work, which is something which can never be assumed when putting a bunch of cards together. In addition, if you upgrade, say, a 10MHz '286 with a brand spanking new 33MHz '386, you are likely to find that other components in the system are going to need replacing.

For example, the data transfer rate of conventional MFM and RLL drive controllers is too slow to do the system speed justice, so it would be wise to upgrade to an ESDI or SCSI drive and controller. Between the motherboard and disk drive system, you've got the lion's share of the PC system in terms of cost, and you could end up getting out of it for less by selling your current system and buying a brand new one. □

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EXTENDED, EXPANDED, ENHANCED EMS, EXPANSION MEMORY

WHAT DOES IT ALL MEAN?

Are you still staggering along with that old PC or XT, regularly dreaming of breaking the 640K barrier? Plug-in memory expansion is the obvious answer – if you can decipher the semantic confusion surrounding memory cards. Stewart Fist translates . . .

WHAT IS THE difference between extended and expanded memory? And which of these (if either) does 'memory extension' refer to? And why would you use one technique and not the other? Can both be used together? And where does EMS and Enhanced EMS come into all this?

You aren't alone in your confusion. A few months ago I was researching an article on accelerator cards and I talked to technicians from a number of card suppliers. Half of them didn't have a clue about the reason behind the PC's original 640K limit, or how extended and expanded memory differed – and the other half thought they knew, but had it wrong.

So let's get hard-nosed about this, and dispel some of the myths.

First of all, MS-Dos doesn't have a 640K limit to the memory size – this myth results from an architectural decision made by IBM when they designed their first 8088-based PC. It carried on in the 8086-based XT range, and then into the 80286 and '386 machines when they are running in 'real' mode. IBM's reason was simple: they wanted to have a firm, fixed location for their video RAM and, as the streaker said to the magistrate, 'It seemed like a good idea at the time' to place this in the address space starting at 640K.

If you want proof that this wasn't Microsoft's fault, check out the old DEC Rainbow. This was an MS-Dos machine that came out about the same time as the first PCs, but DEC set its demarcation point much higher – as did a couple of supposed IBM-compatibles (which weren't too compatible, as their owners discovered). Since IBM's PC hardware set the standard for all future MS-Dos computing, the decision has stuck if you want to use IBM compatible programs. The 640K point represents the boundary between free read-write RAM space (below), and system space (above).

Memory in a computer is best visualised as a single stack with addresses that extend from zero to the highest possible with the available processing chip – see Figure 1). And, the Intel 8086 line (which spawned the 8088 variation that IBM chose to use with the PC) has a 20-bit address bus, so the memory limit can be calculated as two raised to the power of 20, which is 1Mb (or 1,048,576 bytes, if you want to be pedantic).

Now, a computer can't make all of its addressable memory space available just for use by operating systems, applications and data. It also needs some space for mapping the video for the screen, and for other housekeeping functions usually stored in ROM. The video memory map obviously needs its own RAM because it holds the current image of the screen which changes constantly.

Memory addresses

THE POINT of all this is to clarify the fact that if you want to have 640K of usable RAM space in your PC or XT, then you need to have more RAM memory to support the video mapping. These chips may be on the motherboard, on an expansion card, or on a plug-in video card; it doesn't matter where they are physically, the computer will still address them as part of one single address map, from zero to the 1Mb limit.

So in the upper 384K of memory addresses in a PC you will find –

- RAM chips reserved for the video mapping,
- ROMs which control the hard disks and EGA displays,
- A BIOS ROM,
- Some free space, and
- In the uppermost 64K (F segment), the Basic language in ROM.

When someone attempts to sell you a '640K PC', you need to ask whether the machine has the full 640K of 'conventional' read-write RAM space, or is that just a count of the number of RAM chips on board? Some retailers include the video memory RAM in with the count, so there's some variation in what you actually get with '640K compatibles'. Be warned!

According to IBM, the correct term for this bottom 640K of read-write user-RAM is 'conventional' memory, and it needs to be in a continuous run of addresses (contiguous). But despite this, it is not treated simply as a single chunk. To make it easier to work with memory, software programmers divide the total 1Mb of mapped space into sixteen segments, each of 64K. These are numbered from Seg 0 to Seg 9 for the first 10 segments (which makes up the total 640K of 'conventional' RAM space) then Seg A to Seg F, for the six segments used for video RAM and ROM above this to the 1Mb limit.

Just to emphasise one point: this 'system' space isn't totally occupied, there is usually at least one segment (64K) of free address space here, which can be used for expanded memory control.

Don't forget that the original PCs were released with only 64K of user memory, with four rows ('banks') of RAM, each row containing 16K with a parity bit. Later, 256K memory chips were used instead of the 16K ones, and this allowed the maximum memory on the motherboard to rise to 256K. Once the motherboard was fully populated, more RAM had to be added through the use or an expansion card in an I/O expansion slot.

There's another terminology trap here. 'Expansion' simply means anything (memory or any other type of card) which plugs into an 'expansion' slot – so with memory it can apply to normal expansion of the conventional memory (up to the 640K limit), or to expanded memory (bank-switched), or to extended memory (above the 1Mb range). Confusing, isn't it?

So, in the early days of PCs and XTs, expansion was still within the addressable limits of the processing chip (1Mb) – which meant user memory only up to 640K. At the time the PC was being designed, 640K sounded like such a lot of memory, but now it is a severe limitation. Fortunately, some fairly clever things have been done to get around the problem.

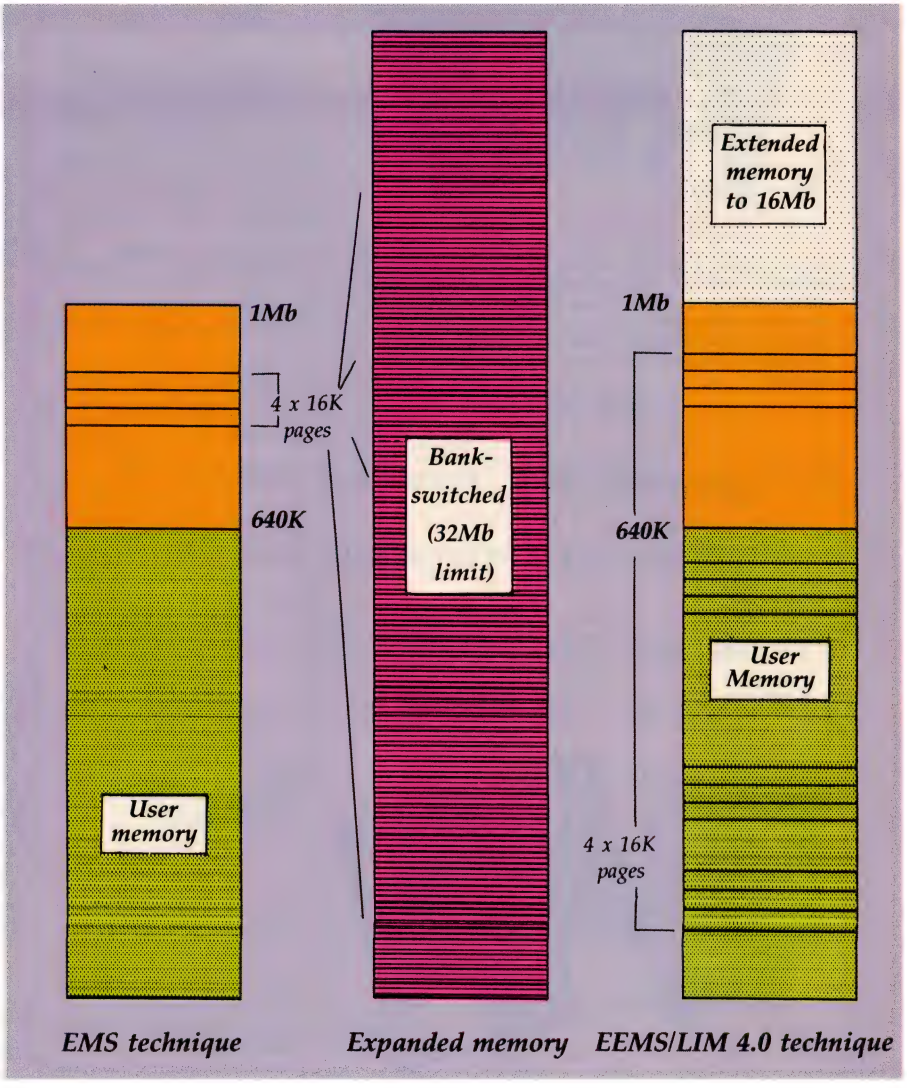

Figure 1. *EMS systems swap 'pages' of memory in and out of four 16K pages of system memory (above the 640K limit) – EMS 3.2 supported 8Mb of expanded memory, while version 4.0 supports 32Mb. The term 'expanded memory' is now applied almost exclusively to EMS. EEMS is AST's super-set of EMS; it allows 64 pages of bank-switching.*

Expanded memory

THE CONVENTIONAL memory must house the operating system, device drivers and memory-resident TSRs (Terminate and Stay Resident programs) in the 640K space, along with the applications and the data. However, you can fool the processor into using more than this through some clever 'expanded memory' software techniques, as long as you have the extra memory chips on a special add-in board. So correctly, this should be termed an 'expansion card with expanded memory'.

The expanded memory technique used is straight bank-switching – a technique copied from the Apple II. The idea here is to exchange memory modules in 16K 'banks' (a quarter of a segment) between the conventional memory addresses and those non-addressed chips on the add-in expanded memory card. You can then use a software switch to drop these banks in and out of the normal memory map – substituting them temporarily for quarter-segments of conventional memory space.

Each bank on the add-in board has a register that specifies its required address, and the operation is controlled by a MMU (Memory Management Unit) on the card. When the program needs to use this expanded memory, it clears the contents of its current address register (saving it on a stack for later recall) and replaces it with those of the required bank(s). As a result of this 'duplicity', the CPU can be fooled into treating two (or more) different sets of memory banks (one on the motherboard and the others on the add-in card) as if they were only one, however, the ad-

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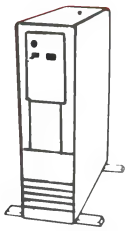

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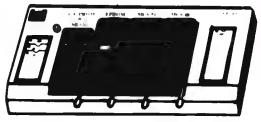

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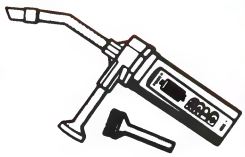

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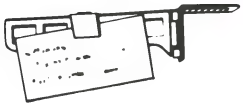

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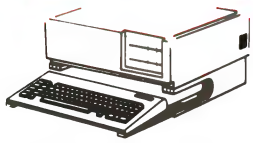

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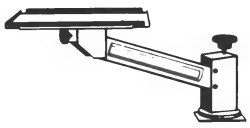

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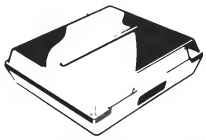

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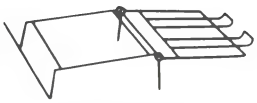

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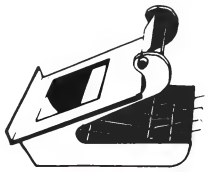

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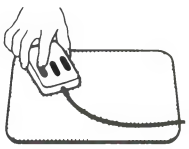

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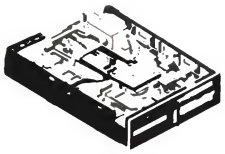

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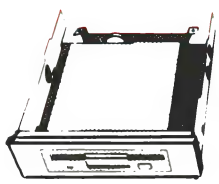

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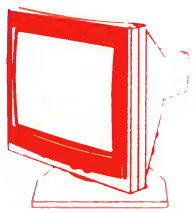

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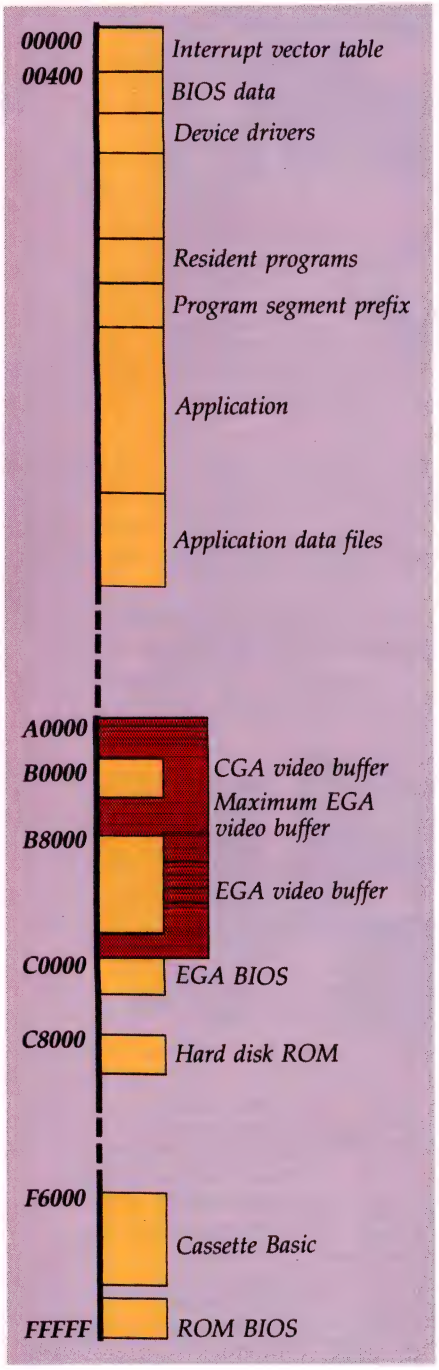

Figure 2. *How the 1Mb of address space is used in Intel's 8088 chip. Note that Dos doesn't have a 640K limit to the memory size – when designing the XT, IBM wanted to have a fixed location for their video RAM and placed it in the address space starting at 640K (A0000 hex in the diagram). The gaps in addresses between the blocks below A0000 are used in bank-switching. The Program segment prefix is a 256-byte header that Dos places before all .EXE and .COM files.*

dress space still remains within its logical limit of 640K.

So bank-switched memory is called 'expanded' memory to distinguish it from 'extended' memory – which we'll come to in a moment. To confuse the terminology even more, IBM becloud things by referring to the chips on the motherboard as 'planar' memory, and those on add-in cards as 'I/O channel' memory. I/O channel memory (if you think about it) can be conventional memory (extensions), or expanded memory, or extended memory. They really go out of their way to make computers difficult to learn about.

To round out this historic picture of 'expanded' memory: note that software could only take advantage of bank-switching and expanded memory when it was written with this possibility in mind. And since there were many ways of implementing bank-switching, the software needed to be matched to the requirements of the add-in memory board. These boards were not cheap because they needed costly MMUs in addition to the memory chips.

An alternative . . .

IF YOU HAVE an AT or PS/2 model 50 or 60, there is an alternative to spending a thousand dollars or more on a memory board – simulate the extra memory. SoftBytes does just that: it simulates the presence of one or more LIM version 3.2 boards. Instead of storing the EMS data in banks on an expanded memory board, SoftBytes uses hard, or even floppy disk space, or that usually wasted 384K above the 640K limit.

Expanded memory boards come with drivers – usually called 'EMS managers' – which provide the interface between the board and application programs designed to use EMS. The drivers take care of 'mapping' available banks of memory on the board into the EMS page-frame (a

Without a single standard for bank switching, few software publishers were willing to gamble on writing software with requirements larger than the 640K limit because they couldn't be sure which add-in memory boards could be used. As a consequence, the hardware manufacturers didn't have software that would use their product, so it was a confused form of egg-and-poultry stalemate.

Then, when the popularity of TSR programs reached the point where a 100K of RAM was being permanently occupied by these accessories, the problem reached a crisis point.

Lotus and Intel both decided that they had to do something about bank-switching standardisation. Lotus was having to write multiple versions of their software to feed the growing hordes of expanded memory cards, and Intel liked the idea of selling more chips – it was in the DRAM business in those days. The result of their collaboration was EMS (Expanded Memory Specification) which allows up to 8Mb of memory. (*For a discussion on the different sorts of RAM, see 'FRAM – a RAM that doesn't forget' in our April issue.*)

Microsoft was quick to realise the advantages of EMS, and from Dos 3.2 on, it ensured that the operating system was compatible. So with Lotus, Intel and Microsoft behind it, LIM (Lotus, Intel, Microsoft) EMS had enough clout to become established as the de facto industry standard – but it wasn't without its challengers: there was a later AST 'super-set' version from AST, Quadram and Ashton-Tate.

Half of them didn't have a clue about the reason behind the PC's original 640K limit, or how extended and expanded memory differed – and the other half thought they knew, but had it wrong.

The LIM EMS specification assumes that at least one segment (64K) of memory space is free in the memory map of a PC or XT between the normal 640K conventional memory limit, and the 1Mb upper processing limit. Not all this space is occupied by video RAM, and the ROM chips. This spare 'window' - page-frame holds four 'pages' of memory, each of 16K. These pages can each hold switched pages from the expanded memory on the card. The EMS scheme allows the software to shunt data or applications in 16K page amounts into this addressable space from an add-in memory card under the control of a Memory Management Unit, and ultimately, device drivers in the software.

The card can hold (and the software can use) a couple of megabytes of this expanded memory, which are simply called in as required; the switch is virtually instantaneous. This memory area is outside the normal 640K, so Dos is unable to access it without special code being written; similarly TSR programs can't use this space. While in the addressable memory space, the pages are treated as extensions to the conventional 640K. So any processor, from the 8088 up, can access and use these pages only if the operating system and software allow access to this system space – the CONFIG.SYS file is used to set up this function.

I must also mention AST's super-set of the EMS standard, known officially as ... would you believe? ... Enhanced Expanded Memory Specification (EEMS). This was promoted to take the bank-switching idea to new heights – to 64 pages rather than the four available with EMS 3.2. Luckily, the two groups eventually got together and the result is LIM 4.0 which incorporated some of the best AST ideas into the one EMS standard.

The AST/LIM 4.0 enhancement did not limit the number of pages available for bank-switching in the addressable space to only those four 16K pages. It allowed a much greater number to be dynamically assigned by the software and to exist in any part of the addressable space. This

Choosing extra memory

AS A ROUGH guide to choosing extra memory, follow these rules:

- For slow speed machines (below 8MHz) on the bottom end of the range (PCs, XTs and slow ATs), buy an EMS add-in board and use the expanded memory system whenever possible.
- With faster ATs, always build memory into the motherboard before you consider adding EMS on hardware. It is always faster to use EMS emulation software and the motherboard extended memory for EMS, than add-in expanded memory.
- With '386 computers you should always add memory to the motherboard first, then by using proprietary 32-bit expansion units, before considering off-the-shelf add-ins. Avoid using 16-bit expansion memory cards with these computers.

64K contiguous block of memory in the address space accessible to Dos – see Figure 2 in the main story).

SoftBytes stores and retrieves data from a disk or from extended memory and can simulate up to 8Mb of LIM/EMS – it does it easily – installation took only took several minutes. If you've got memory problems with the likes of 1-2-3, Framework, Quattro, Q&A or WordPerfect, at $149 this could be the cost effective solution. The program itself uses about 70K of conventional memory when activated and only 5K when deactivated.

However, like most simulations it's not perfect. For example, it doesn't allow page-aliasing – that's the mapping of the same logical page (bank of expanded memory) into more than one physical page. This means it can't be used with Javelin, Lotus HAL or other programs that need aliasing.

The page is slower than an expanded memory board – this may or may not be a problem, depending on how the program triggers the mapping and how it uses the expanded memory. The SoftBytes manual points out that some software will actually run faster without simulated EMS, than with it, because of the way it handles page mapping – Paradox was the example.

Ideally, you should take a copy of the application you want to try with SoftBytes' simulated memory with you to a dealer and try it before you buy – our copy came from Software Express: there are offices in Sydney, (02) 519 3249, and Melbourne, (03) 663 6580.

As a bonus with the simulated memory, a print spooler is supplied on the program disk. This can be a godsend if you need to print large files and would like to go on using the computer. For example, we 'spooled' a 166K file: printing it took over half an hour, but use of the computer was lost for less than a minute.

Virtual memory

THE '286 AND '386 machines are capable of supporting gigabytes of 'virtual memory'. This is a software function made possible by the MMU working in conjunction with a modified operating system. Virtual memory allows the computer to fake enormous memory capacity, by allowing programs to ignore the distinction between RAM and disk storage. All the available RAM, and all the available disk space can be written to, and read from, at will.

The disk-based memory is divided into 'frames', that are swapped in and out of RAM as needed. Usually the frame will be the same size as a segment (64K on the '286), and the MMU will keep track of what frames are currently residing in RAM and where the others are on the disk.

The operating system must be capable of making decisions as to which are the least-needed frames in RAM, and instructing that these be copied back to disk to make room for new frames that are needed. Often these decisions are made on the basis of 'clock algorithms' which drop a RAM frame if it hasn't been used for some time.

meant that these pages could be switched in both above and below the 640K barrier, thus making the system far more efficient and flexible, especially for multi-tasking and multi-user systems. Finally, the combined set of expanded and enhanced-expanded standards for memory are now known as E/EMS, just to add to the confusion.

So much for expanded and enhanced-expanded memory systems which are all based around the limitations of the old 8088 chip with its 20 address bus lines and its 1Mb peak address. The next subject in this cognitive web of semantic confusion, is the extended memory system, which came about because later Intel chips that evolved were able to address more than a single megabyte.

When the IBM AT made its appearance (powered by Intel's 80286 chip), the IBM PC family jumped from 20 to 24 address bus paths, and therefore, memory limits rose to a maximum of 16Mb (two raised to the power of 24). What is more, the AT's microprocessor was able to operate in two modes: the 'real' mode which imitated the standard PC and ran conventional MS-Dos and Dos-based applications, and the 'protected' mode. However, for a long time there were no applications written specifically for the '286's protected mode – except if you were interested in Xenix – so most ATs have always been employed as super-Dos PCs in the real mode.

Extended memory

IN THESE '286 machines, the memory space above the old 1Mb limit became known as 'extended memory' (which it was from the real mode's point of view – but not really from that of the protected mode). If you intend to use your machine to run OS/2 or programs such as Oracle (which have been specifically written for the protected mode, then this 'extended memory' is simply treated as a continuation of the first megabyte.

In this real mode/Dos-emulation environment, any read-write RAM above the normal 640K limit (but with addresses above the 1Mb range) could only be used as a print or disk spooler, or as a RAM disk. It was a cache area into which data was put when it wasn't actually needed by the processor.

According to IBM, the correct term for this bottom 640K of read-write user-RAM is 'conventional' memory.

There is one seeming exception to this: the XMS (eXtended Memory Specification) devised by AST, Intel, Microsoft and Lotus which allowed Dos to use 64K of 'high-memory' (above 1Mb) extended space as an extended read-write area, for a total of 704K. Windows/286 seems to be the only current program to recognise this extension, but it is available for others.

The XMS extended memory specification is a complex piece of memory map manipulation which allows addresses above the top end of the normal PC range to wrap around and appear at the bottom of the memory map, but 'only on machines having an A-20 address line', I am told. (I believe them!)

The difference between expanded and extended memory is supposed to be that the former does not have specific memory addresses. Expanded memory gets added to the system page by page, and assumes the address of the page-slot into which it is added. Extended memory has its own specific addresses above the 1Mb limit.

I don't understand XMS and it isn't important anyway, so I won't go any further. It appears to me to be a complex form of bank-switching, but Microsoft insist that it is extended memory.

Whatever! The software needs to be able to handle this rule-breaking if it is to take advantage of these rather minor extensions. You may wonder whether it was worth the bother, but it was at the time. Are you still with me? Unfortunately, it gets a trifle more complex yet!

The point is that '286 and '386 machines can have addressable memory above the 1Mb limit, but if they are running Dos and standard Dos applications in their 'real' modes (or in the 'virtual 8086' mode of the '386), the Dos can't see or use more than the 1Mb.

Extended memory with '286-based computers can go as high as 16Mb, and with the '386, as high as 4 gigabytes. And, both '286 and '386 computers can use both their extended memories and the old bank-switched expanded memories, if the application has been written to take account of this. This is what makes it all so confusing. An add-in expanded (bank-switched) memory card can also double as a normal extension of memory in these later computers (although you are wasting the MMU chip) but, with the exception of the disk and print spooling noted above (and XMS), you can't use this extended space in the 'real' mode. It is not for standard Dos applications.

Well, now! Suppose you have a '286 or '386 machine with a couple of megabytes, and you always use it for Dos applications. Since you've got all this extra memory unused on the motherboard in the 'real' mode, why should we need to add a special memory card to run the bank-switching expanded memory system? Why add new chips when we've got some sitting idle?

The answer is that you need a MMU (Memory Management Unit) to handle the bank-switching. The '286 doesn't have one that can handle this operation unless it is specifically provided on the add-in card – but fortunately, the '386 has such an MMU built-in. The '386 microprocessor can change the address of any bank of memory in the system. Therefore, with the

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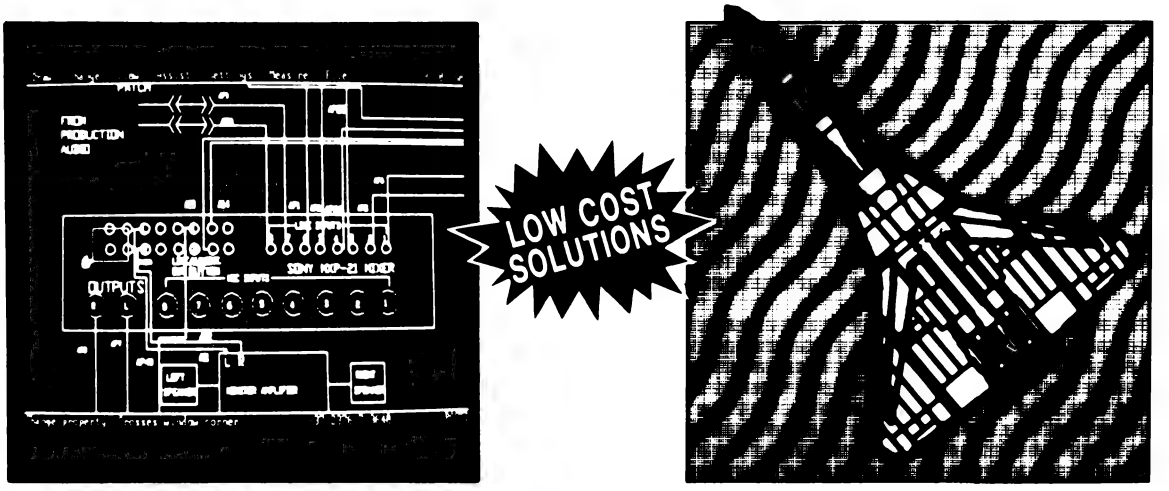

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Memories are made of . . .

TO HELP sort out the confusion in terminology, here's a brief definition of the commonly used expressions –

EEMS: Enhanced Expanded Memory System – AST's super-set of EMS; it allows 64 pages of bank-switching, rather than the four available with EMS 3.2. The two were combined into AST/LIM 4.0 which allows pages to be switched in both above and below the 640K barrier (see Expanded memory).

E/EMS: Expanded/Enhanced Memory System – a general expression for all standardised forms of Dos memory management.

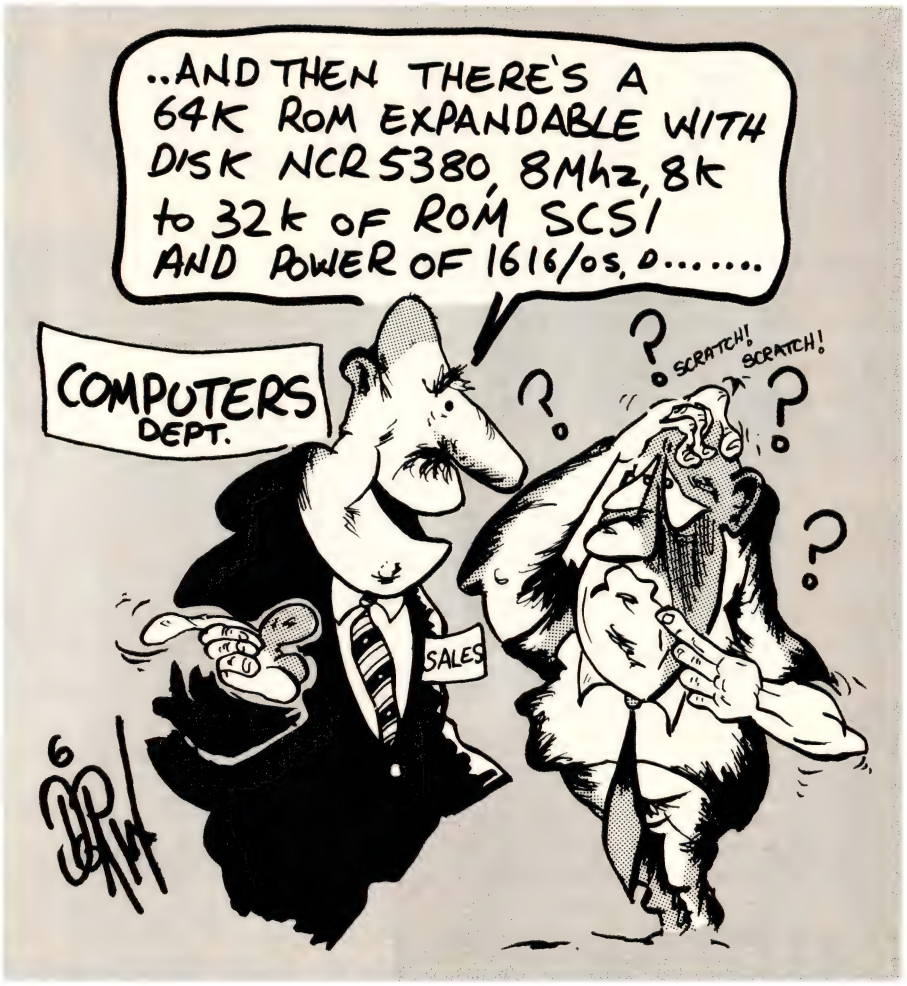
EMS: Expanded Memory Specification – the Lotus, Intel, Microsoft (LIM) collaboration which allows up to 8Mb of memory.

XMS: eXtended Memory System – devised by AST Research, Intel and Microsoft to allow Dos to use 64K of extended (not expanded) memory for a total of 704K. Windows/286 was the first program to recognise XMS.

Expanded memory: Originally a general term for a number of bank-switching techniques, but now it is applied almost exclusively to EMS. The LIM group devised this standard way of expanding the 640K limit. EMS systems swap 'pages' of memory in and out of four 16K pages of system memory (above the 640K limit). Not every program can use EMS because its sophisticated form of bank switching requires the hardware and software to work together. EMS 3.2 supported 8Mb of expanded memory, while version 4.0 supports 32Mb.

Expansion memory: A very general term which refers only to chips on an adapter card without defining whether these are being used in the expanded or extended state.

Extended memory: The extra memory above Dos' 1Mb limit; it is straightforward additional memory for 80286 (AT-class) and '386 machines. Only a few Dos programs can use it; the most common examples are utilities and disk caches. This memory space is primarily available for the likes of OS/2 and Unix, with the processor running in protected mode.



right software drivers and Dos, the extended memory of a '386 sitting unused above the old 1Mb limit, can now be made available for bank-switched expanded memory. Now extended memory is also expanded memory!

The result is LIM 4.0 which incorporated some of the best AST ideas into the one EMS standard.

The way it does this is to temporarily switch the processor from real mode to protected mode using routines contained in the AT's BIOS chip. The device drivers used in the E/EMS expanded memory system must also be modified to perform this function. You can get Above Disk and several other drivers for this purpose. Both Above Disk and a software developer's product called 386/VMM allow programs to use extended RAM even greater than the four gigabyte limit by swapping into a virtual memory mode when it senses the end of RAM addresses, and using the hard disk as a natural extension.

Got that?

Just a final point. With '286 and '386 machines, when we talk about memory, we recognise that it exists in three blocks. The 1Mb machine you buy from your local retailer will have the normal conventional memory in the address space extending upwards from zero to 640K. Then the next 384K of address space (to the 1Mb point) will be reserved for the standard video and ROM functions, and finally, there will be 384K (to make up the 1Mb of user RAM) of 'hi-mem' extended memory occupying addresses from 1Mb up to about 1.4Mb.

However, you've got to be careful here. Some of the AT-clones, and many '386 systems, reserve for themselves some system space within this top 384K (supposedly 'extended memory') so you won't get your full 1Mb of usable RAM.

Now, you are allowed to go away and quietly beat your head against a wall! □

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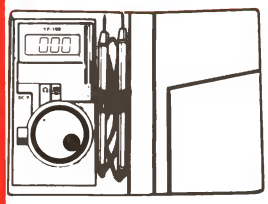

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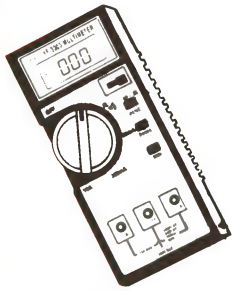

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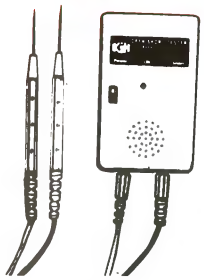

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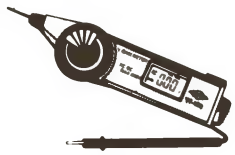

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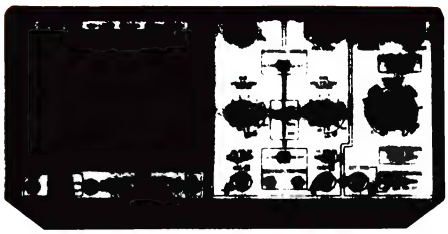

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- Triggering Level: Positive and Negative, continuously variable level; Pull for Auto
- Sync: AC, HF Rej, TV (each + or -) at TV Sync. TV-H (line) and TV-V (Frame) sync. are switched automatically by SWEEP TIME/Div switch.

HORIZONTAL DEFLECTION
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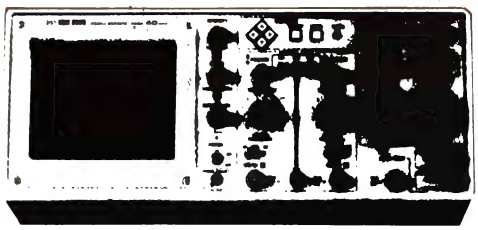

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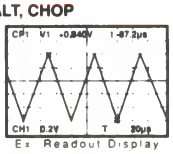

Ex Readout Display

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- Bandwidth DC: DC to 1MHz (-3dB)
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- Linearity: ±3% or better

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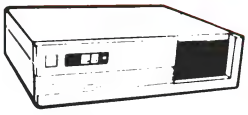

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BENEATH NEURAL NETWORKS

PART 2

Neural Network research will give us computers that learn and find new solutions on their own. 'But will they have emotions and a soul?' Craig Kirkwood wonders.

IN ORDER TO comprehend the way the brain learns from a cognitive perspective (as opposed to the biological) we must understand the way people learn and solve problems. One of the mechanisms used is heuristics – the internal strategies and common methods by which humans solve problems. This includes 'rules of thumb', educated guesswork, and generally the integration of our many problem solving capabilities.

When I walk to the shops to buy a newspaper, for example, I will be making countless decisions involved in that action. To cross the road, I will make judgments on where and when to cross, based on a host of past experiences. I will not, on the other hand, calculate the speed of oncoming cars, or arrive at a mathematical relationship between the time it will take to get to the other side and the time it will take for the approaching traffic to flatten me.

While the brain is settling on a final path to make a decision, it continually monitors a flood of additional input. Any of this subsequent input can be instrumental in changing the choice of path.

Animals learn constantly. Their behavior is modified through experience to allow them to adapt to the world. Neural researchers pay heed to the examples of the biological world by developing systems that mimic the specific patterns of animals – including humans.

The process of learning is complex. Just how do we develop heuristics to cross the road? How do we learn to recognise faces? How do we learn to read and write? Why does repetition and practice improve our performance? Why do some activities, such as eating and crying, not have to be learnt?

We don't know entirely, but we see the clues in the way neurons activate when stimulated. At any given time, a given neuron has some level of excitement or activation that determines whether, and how strongly, it will produce an output signal of its own. Hebb's law states that 'if a neuron, A, is repeatedly stimulated by another neuron, B, at times when neuron A is active (for whatever reason), then neuron A will become more sensitive to stimuli from neuron B; the synaptic connection from B to A will be more efficient. Thus, B will find it easier to stimulate A to produce an output in the future.'

Hebb's law is not quite a mathematical statement of learning and has its limitations, but it has been vital to our understanding of the neural model. Researcher Stephen Grossberg, has developed the principal further by analysing conditioning and responses such as that which Pavlov demonstrated in his famous experiments with salivating dogs.

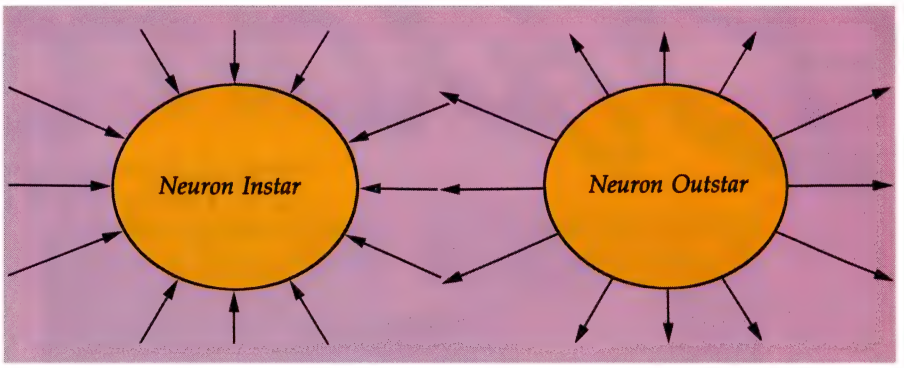

Figure 1. *In any Neural Network, including the human central nervous system, every neuron receives many input signals. From the neuron's point of view, it is at the centre of a large number of inwardly directed input signals and connections. This is called the instar. Every neuron also generates a single output signal which is distributed to a large number of other neurons – the outstar.*

Pavlov began to train dogs by ringing a bell whenever he showed them a plate of food. He did this many times, always ringing the bell at the same time the food was presented. Eventually, he found that when he rang the bell without showing the food, his dogs dribbled on the floor. Eureka!

What, you may ask, does that have to do with Neural Networks? Well, this is an example of conditioning and response. The bell is the 'conditioning stimulus' and the saliva the 'conditioned response'. The dogs are conditioned because the behavior has been learnt. Grossberg pondered this experiment and tried to understand what structures in the brain could account for such learning behavior. He came up with the principle of 'instars' and 'outstars' – a useful analogy to the way neuron connections learn.

Neural stars and bars

AS YOU CAN SEE in Figure 1, every Neural Network is composed of a complex, interwoven mesh of instars and outstars. Every neuron is simultaneously the centre of an instar and an outstar, as well as a border neuron for other instars and outstars. The operation of the network is thus dependent on the interactions between instars and outstars.

Grossberg went on to develop a mathematical equation for the way in which the stars are activated when stimulated, and the way in which they cease to be activated when the stimulation is removed. The 'deactivity' which occurs brings us to another important point – a Neural Network must not only learn and remember, it must also forget.

So, now we have a broad outline of how a Neural Network, like that of the Central Nervous System, is composed. How do we recreate one? How do we achieve external stimulation like that of the body's senses? How do we find a substance which will exhibit the properties of learning, remembering, and forgetting?

Most models have so far been created using software. This is interesting. Earlier I said that conventional computers merely execute instructions one at a time and therefore are performing a duty rather than learning or behaving. Many researchers, though, have developed a neural model on conventional hardware. It remains true that at the grass root level, the machine is working one instruction at a time, but this is only an engine. Through software neural modeling, the hardware is being made to exhibit the parallel, interconnected properties of the biological version.

There has, incidentally, been some research into using actual organic material to develop a computer. Rather than use the semiconductive properties of silicon or germanium, scientists have been exploring the potential of using biological gates. The principal is the same as silicon, except the current flowing is electrochemical rather than electrical.

Another approach embraced by several manufacturers, mainly in the US, is through silicon hardware. Heicht-Hielson Neurocomputers, California-based AI specialists, have been producing commercial hardware networks as add-ons for PCs for some years. Last year they released the

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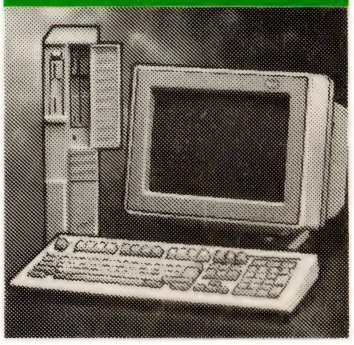

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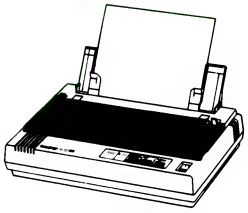

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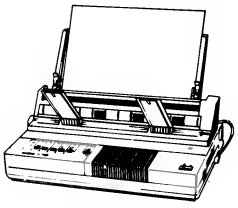

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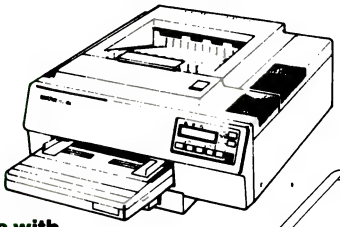

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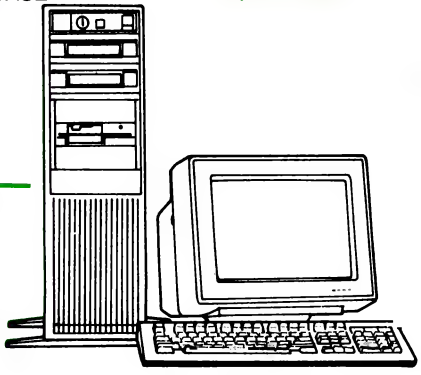

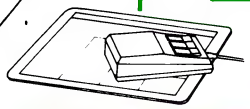

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ANZA-Plus designed to 'transform your PC-AT or Zenith '386 into a powerful neuro computing workstation'. This particular example is based on the Weitek XL RISC (Reduced Instruction Set Computer) processor and boasts speeds of 20 megaflops. According to David Shlager, vice president of sales, 'the ANZA-Plus is designed for both applications development and delivery. It is ideal for applications where real time response is critical, such as continuous speech recognition, image processing, high speed industrial inspection, signal processing and process control.' The board is apparently supplied with Neurosoft software which interacts with C programs.

One attempt to build a Neural Network in the form of parallel computers was described by Daniel Hillis in 1986. Hillis' Connection Machine was a parallel computer which he described as an 'active memory'. The machine's memory is divided into roughly 65,000 small pieces, each of which is controlled by its own simple processor. The software mimics this structure, relying on a method of data structure that is distributed over the active memory with only one datum (piece of data) per processor.

The Connection Machine's architecture is considered 'fixed', that is, certain processors are physically connected to certain others. The machine's power is due to the fact that any pair of processors not connected can communicate in software via special devices called routers. It is critical that connections between processors be programmable so that the machine is not limited in the types of networks it can realise. It is foreseeable that this flexibility and plasticity is similar to that exhibited by the brain.

The principle behind the Connection Machine is that it is, like the brain, composed of many units most of which are active at the same time. In a conventional computer, most of the silicon is lying dormant, only the CPU and a few memory elements are active at any given time. The Connection Machine is, theoretically, far more efficient in its use of resources.

This machine is also not the only example of parallel computing. A great deal of research has gone into this field alone. According to Mathew Zeidenberg, 'Neural Networks represent only one line of research in parallel computing. Basically, you must answer two fundamental questions in designing a parallel computer system: How do you connect the processors for communication purposes? And how much computing power and memory do you put in each processor? Many researchers see no reason to restrict themselves to Neural Network models, which represent only a small subset of the possible parallel computing models'.

Turing and his theory

THERE IS A school of thought which says modeling the brain is not particularly relevant in creating artificial intelligence. The argument being that there is no philosophical reason why an intelligent machine should be anything like the human brain.

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Alan Turing, known as the 'grandfather of computing', wrote his classic paper On Computable Numbers *in 1936 – his dream was to build a 'brain', a Universal Machine. He heavily influenced everyone from von Neumann (of 'bottle neck' fame) in the US to the team that built the first post-war British computers.*

In the 1940s, Alan Turing, now immortalised as the 'grandfather' of computing, was probably the first man to think about intelligent machines. Turing approached artificial intelligence (then called cybernetics) by defining the similarities and dissimilarities between the brain and computers. He believed, ironically, that if the way the brain works could be broken down to its tiniest details, a model that simulated human intelligence could be fashioned on a computer.

Turing's machine was based on binary programming – the principal on which virtually all computers to date work. A binary program is a list of ones and zeros which the computer reads as prompts to turn its circuits off or on. The program is serial, and instructions are executed one at a time. Any program designed to run on 'conventional' hardware, be it PC, mini, or mainframe, works on this principle, at least, at the grass root level. The course of the program may be changed according to input or results from an equation, but every instruction is executed one at a time.

Let's run through how that works. I write a line of code in, say, Basic. That code is 'compiled' into a set of hexadecimal (base 16) numbers. Those numbers are stored as binary (0 or 1) numbers in rows of memory cells. The cells may be 'gates' of silicon or magnetic cells on the surface of a disk. Each cell represents a one or zero by being on or off (according to an electrical charge). Each pattern of ones and zeros represents an instruction or a piece of datum. When the program is run, the contents of the memory cells are examined by the CPU, which in turn performs an action based on the inherent message in the stored number.

Turing believed that the designs he had were synonymous to the way the brain works. That's where he went wrong. Turing's machine, the computer we've all come to know and love, is not based on the interconnection of nodes – at least not in the way the biological model is. His machine doesn't learn and process information like we do. Is it therefore not intelligent? There's our philosophical problem.

Here is another. Can we reproduce emotion and feeling on a machine? Anyone commercially involved with computers will tell you that there is absolutely no reason to feel threatened by our digital friends.

Until recently the thought of a machine that actually learns was unheard of. So was a machine that was made of several million gates called transistors. Now we have machines that interconnect faster than a biological brain, and we are developing a model that is indeed learning for itself. OK, we're a long way off, but as far as I can see there is no reason why we can't do it. Will it feel, love, hate? That depends if our feelings and emotions are merely the strengthening and stimulation of biological nodes called neurons. If that's the case, then why not? The question is 'do we really have a soul'? Is our personality dictated by a spirit or is it merely the nature of our chemical construction that determines our character? Ponder on that one, dear reader, and wait for the future . . . □

FILEOPTICS

A leading Australian specialist teaching hospital expects major efficiency gains from a new medical records filing system.

BASED ON OPTICAL disk imaging technology – compact disks – the Royal Victorian Eye and Ear Hospital is one of the first Australian hospitals to embrace the latest mass information storage techniques. The hospital has chosen an Australian designed and developed software product, FileOptics, from the document image processing specialists, Image Automation.

Chief medical records administrator, Karen Dawson, said FileOptics would be piloted initially for medical records management, while the hospital's executive director, Jim Kerrigan, said he would be carefully monitoring the performance of FileOptics with a view to ultimately expanding its use throughout the hospital for pharmaceutical, pathology, payroll and personnel records.

To the system, information is stored only as a picture. This allows storage of any image, including handwriting, charts, photographs and other documents. FileOptics runs on a standard IBM compatible PC/AT workstation with a 5¼ inch optical WORM drive (Write Once, Read Many times), high speed document scanner, laser printer and a 19-inch high resolution monitor, all running under Microsoft Windows. The system can be upgraded into a multi-workstation local area network configuration, providing immediate access to images anywhere within the hospital.

Dawson said a major attraction of FileOptics was its local development: 'We were able to talk to the people who actually wrote the system and discuss configuration for our own requirements.

'We also like it because it is so easy and fast to use. We will be able to process documents far more efficiently than we can on our exiting microfilm based system.

Kerrigan said the inclusion of imaging technology would enhance the hospital's current computer system: 'A major advantage of FileOptics is that it integrates seamlessly into our existing applications, including the McDonnell Douglas system.'

A user is still able to access all of the sophisticated searching and indexing on the main system, and with the click of the mouse, view or produce a hard copy of the relevant documents on the one workstation.

Image Automation's managing director, Nick Woodward, said his company would be working closely with hospital staff to customise the system to the hospital's unique requirements: 'This is our first hospital installation and we expect that many other hospitals will watch the Eye and Ear Hospital's experience with FileOptics with great interest. It's exciting new technology, and it's certainly the way of the future.' □

FileOptics is based on optical disk imaging technology using a WORM drive. The optical (compact) disk is contained in a dust and shatterproof cartridge for easy handling.

Product Details

Product: FileOptics
From: Image Automation
180 Albert Rd,
South Melbourne 3205 Vic.,
(03) 696 0833
Price: under $60,000 and includes: laser printer, document scanner, optical disk drive, PC workstation, specialised image software and hardware, and a 19-inch high resolution monitor.

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Here is a selection of programs to try while you are testing software for your needs. We consider this selection to be the best value around.

GENERAL INTEREST

G010 PC WRITE: Vers 3.01. The most respected and used PC Word Processor in the world. (NOTE: 3 DISKS)

G012 PC FILE PLUS: An excellent, yet easy to use, database program. Menu driven for ease of use. (NOTE 3 DISKS)

G016 PC CALC PLUS: This spreadsheet has its own tutorial, and a number of advanced features, including screen prompts. (NOTE 3 DISKS)

G020 PC DRAW: This program allows graphics with slide show capabilities. It has built-in technical features allowing it to be used for a DESKTOP PUBLISHING SYSTEM. Gives keyboard drawing AND MOUSE AIDED operation. (Requires CGA card which is standard with most IBM computers) (NOTE: 2 DISKS)

G170 GALAXY: LOOK!! The easiest and most efficient word processor to use. This magnificent program features pull down windows (help screens). Turn into a most competent secretary. This is the easiest.

G182 WORDPROCESSING GRAPHICS: This is a great program for those with limited graphics on board their computers as it uses ASCII to create designs.

G099 FARM MANAGEMENT: A 3 disk set of analysis tools for the person on the land. (NOTE: 3 DISKS)

G157 AS EASY AS: A brilliant Lotus 123 compatible spreadsheet program with excellent graphics for all charts and graphs. It is much easier and more functional than its more popular cousin . . . In fact it's AS EASY AS abc . . .

G179 FINANCE MANAGER: This excellent NEW accounting program. THIS is MUCH improved. (NOTE: 2 DISKS)

EDUCATION

E622 MATHS TUTOR: This program is a valuable one for parents or teachers. You can work through the problems with the student by modifying the problems. Kindergarten to 6th.

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E608 COMPUTER TUTORIAL: This is a must for all new computer owners as it explains everything to get you going. GREAT PROGRAM.

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F409 SUPER COMPILED GAMES: A collection of arcade games includes Striker (a great helicopter adventure).

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F434 MONOPOLY: Excellent game of monopoly.

F415 BILLIARDS (8 BALL): Naturally, it also includes 8 ball and straight pool. A tennis program is also included on this disk.

F472 BASSTOUR: A fun game for the keen fisherman on a wet day. It even supplies the boat and lake and all the gear (on screen).

F459 STAR PILOT: This is a flight simulator with a difference. With this program you become the astronaut you always wanted to be by flying your own spacecraft.

F458 PGA GOLF: Another excellent golf game with good graphics.

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PATCHWORK FOR COMMUNICATING DATA

Wouldn't it be great if you could quickly download critical data to your PC from a mainframe? John Hepworth found Patchwork – a package that can do just that.

THE BIBLICAL TOWER Of Babel is a symbol of communication problems between people of different languages or racial backgrounds. In the computer world, there are many such towers – PC to Mac, PC to mainframe, and PC to mini. Typically, the user needs numerical or financial data from the mainframe, or a foreign micro application, and wants to massage it in a spreadsheet to come up with the information to make critical and timely corporate decisions.

Getting data from a mainframe or mini application to a micro can be very difficult. Rarely will the mainframe give output that can be read straight into a PC program. With the programming backlog in many mainframe systems, a custom application to extract data can't be written when you need it. The most that can be expected is that a standard report will be written to disk on the mainframe, instead of being printed, and then downloaded to a PC via a 3270 emulation board.

Taking data from one PC application to another can be hard if their native file formats are radically different and have no common third-party file format for import and export of data. You could write a program in C, Basic or Pascal, to read a file from one application, extract data, and write another file that the second application can understand, but this isn't a trivial task. It's beyond the abilities of most end users, and few in-house technical support staff have time to do it for them.

The traditional solution has been to take a stack of printouts, mark up the important data with a highlighter pen, and then manually type it into a spreadsheet. Imagine the opportunities for error and omission, and the disaster that could occur if a corporate decision is made on a spreadsheet created with corrupted information.

A godsend would be a program that could, with guidance from the user, intelligently analyse an ASCII file, extract the desired information, and write it to a spreadsheet file.

Patchwork, from Seamless Software, is a new Australian product that does just that, powerfully, conveniently and with style. It simultaneously uses an input ASCII file containing the report, a Lotus .WK1 file into which it will write the output and a script file called a Patch file which shows Patchwork how to step repetitively through the input file, extract just the information that the user needs, and write it to the output worksheet.

Upon starting Patchwork, three windows are seen on screen. The top left window is used to display the input report file. The top right window displays the output .WK1 spreadsheet file. Across the bottom of the screen is a third window for the Patch file. Any one of the windows can be zoomed to take half the screen, or the full screen, and can be just as easily shrunk to the original size. Pressing the slash key pops up a Lotus-style menu at the top of the screen. From this, the typical end user will, with a couple of commands, load a Patch file and run it. This will in turn load a report file and skeleton worksheet file, analyse the report and write selected data to the worksheet.

Product Details

Product: Patchwork
From: Seamless Software Pty Ltd
100 Walker St,
North Sydney NSW 2060
(02) 954 9073
Price: $490 for one copy
(discounts for two or more)

If you have data on a mainframe and want to analyse it on a PC, Patchwork is absolutely essential!

Provided that the report file always has the same layout, any one Patch file can be used time after time. But, should the report layout change, it's very easy to modify an existing Patch file or to create a new one. Minor modifications to a Patch file are made using an editor built into Patchwork. To create a new Patch file, the user toggles Patchwork into Learn mode. Having worked out, by inspecting the original report, what data is to be extracted, the user then walks Patchwork through the first few lines of the report, with Patchwork noting the various keystrokes and recording them in a Patch file along with various commands. Patch files use a powerful programming language somewhat reminiscent of Basic, complete with Gosub, Goto, If ... Then ... Else, and around 25 other commands. Thus, looping through a few lines in a Patch file can quickly work down a report many pages long, and put the extracted data into exactly the right cells in the output spreadsheet.

Hardware requirements

PATCHWORK WILL run on almost any PC, AT or '386. Even on a PC, speed is acceptable, while on a '386, it will typically only take a minute or two to read a report file and write a spreadsheet file. Patchwork can run on a floppy disk system, but a hard disk is very desirable as Patchwork makes quite a few disk accesses as it reads a report file, and repeatedly reading a floppy disk significantly slows it down. All standard video systems are supported, and Patchwork uses 43 line mode on EGA, 50 line mode on VGA, and 25 lines on other video systems.

Patchwork is a product that solves a major problem in every organisation that has a mixture of PCs, minis and mainframes. The Patch file makes it easy to extract the right information from report after report, with little intervention by the user, and even less opportunity for error. Creation of a Patch file takes thought and a little time to decide what information in the original report is to be extracted and how to lay out the spreadsheet. After that, it takes little time or effort to create. The use of the Lotus .WK1 file format means

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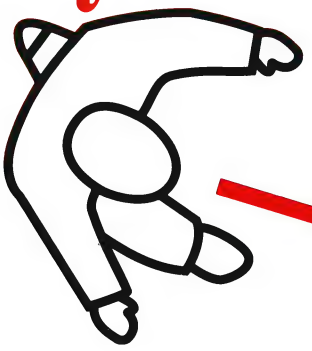

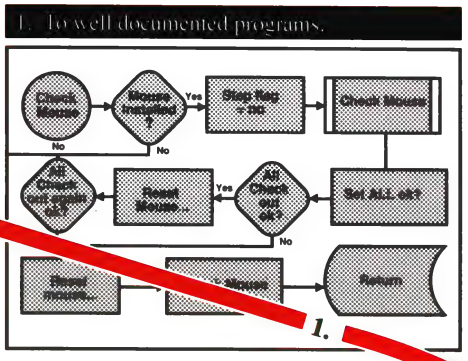

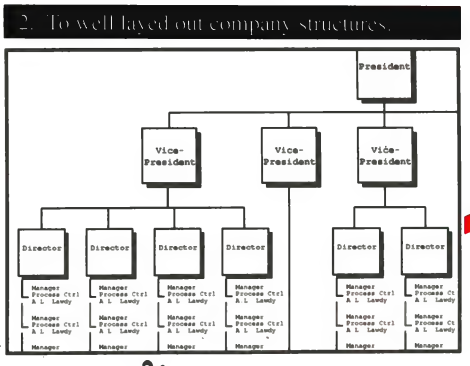

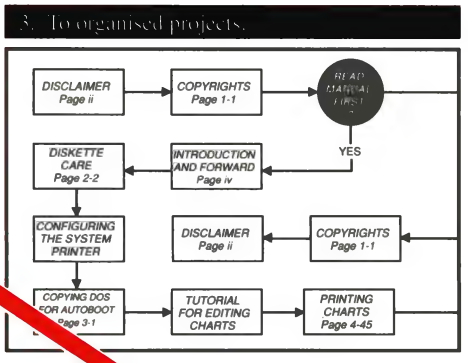

Flow Charting II+ takes you to a world of organized thinking specifically designed for flowcharts and organisation charts. Flow Chart construction is not just a graphics program that has other things to do. *Flow Charting II+* lets you: Type inside or outside shapes, on line or free area. Define pieces of your chart to save in special images files for later use in other charts. Define pieces of sections anywhere on the chart, to move, copy, or even delete. Zip across your charts with an accelerated cursor or use the cross hairs on the shrink screen at a faster pace.

1 **FLOWCHARTING II+ Features**
10 Font Styles: You can choose from normal, bold, high, wide, fat, Greek, super-script, sub-script, or title.

2 **A Wide Variety of Shapes:** 26 shapes available. Shaded boxes available. Perfect for organisation charts and a summing function for the mathematicians.

3 **Undo Lines:** If you draw a line to the wrong place, your back space key in line mode will erase it right back to its origin, redoing connectors and bypasses as it travels.

4 **Text Functions for Quick Editing:** Blocks of text, words, or even just letters can be moved, deleted or inserted quickly and neatly. Select Auto Centring and let the program do the placement within shapes - or turn Auto Centring off and put comments alongside the chart.

5 **Comfortable User Interface:** Function keys or alpha keys to select options. Full mouse support for the non-typist.

6 **Print Multiple Files Without Interruption:** Charts are constructed for standard paper sized, 8 1/2" x 11", 8 1/2" x 14, or 14" x 11". Select charts to be printed, and the computer can print them without interruption.

7 **Presentation Quality Charts with Flowchart II+:** Using *Flow Charting II+* you can either print out draft quality charts for quick evaluation, or presentation quality for your moment in the spotlight.
(*Flow Charting II+* now includes Laser Charts for Laser printer speed and resolution)

8 **In Line Mode Your Cursor Is A Scribe:** The F2 key turns your cursor into a scribe and gives it the run of the page in any of four widths; normal, bold, hollow and dashed. You can choose whether the line stops at a shape, or draws right over it!

9 **3 Screen Views:** *FlowCharting II+* gives you a flexible screen ensemble that makes chart construction and editing a pleasure.
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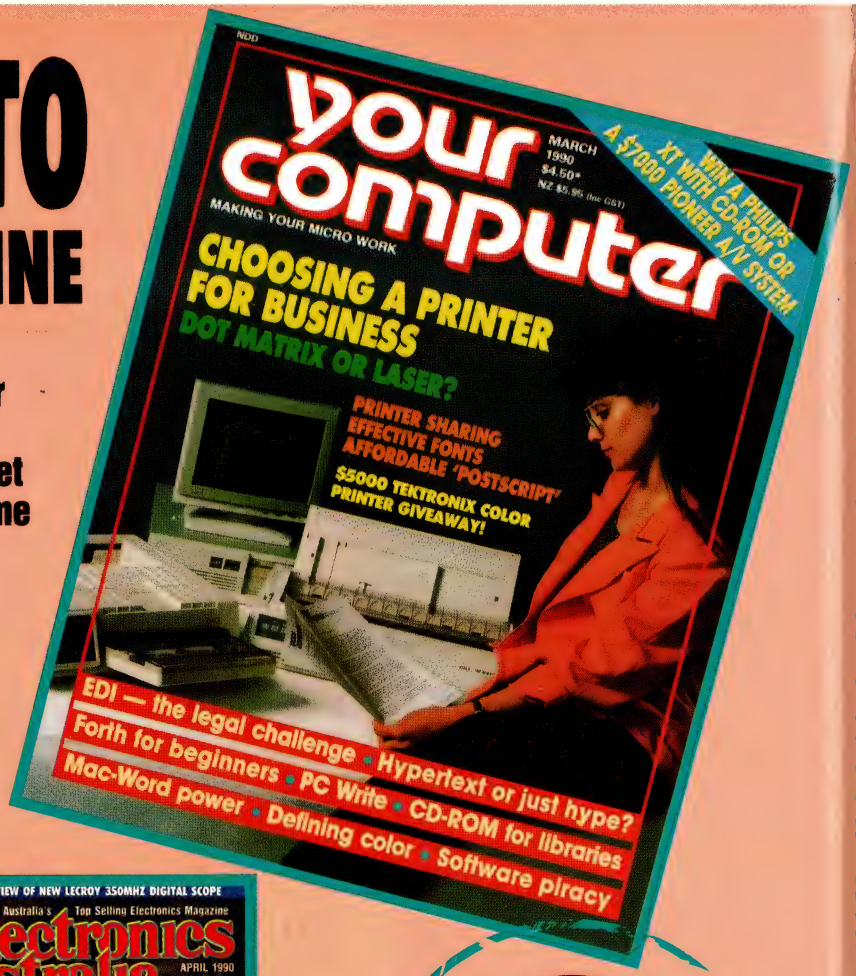

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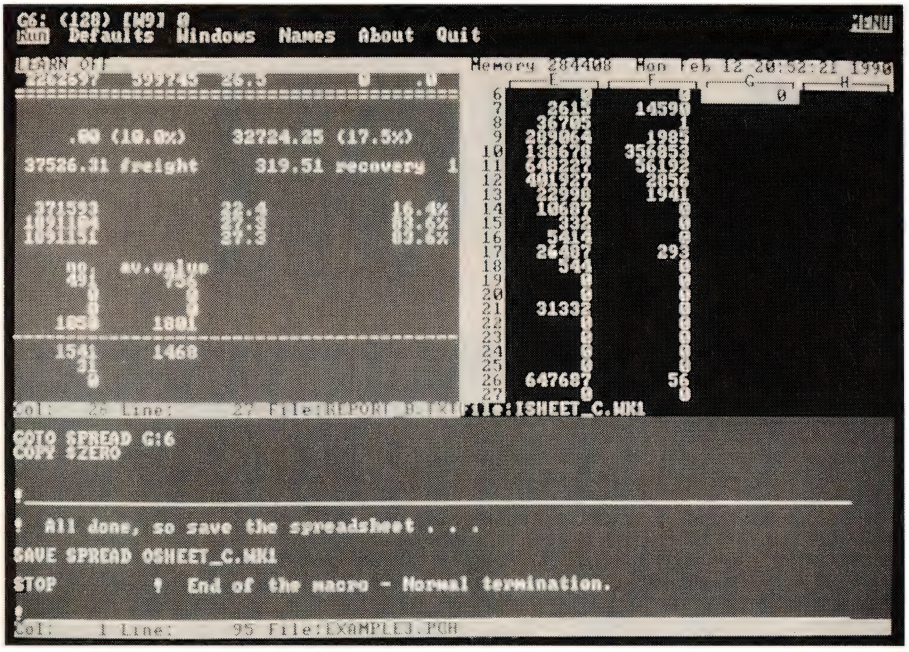
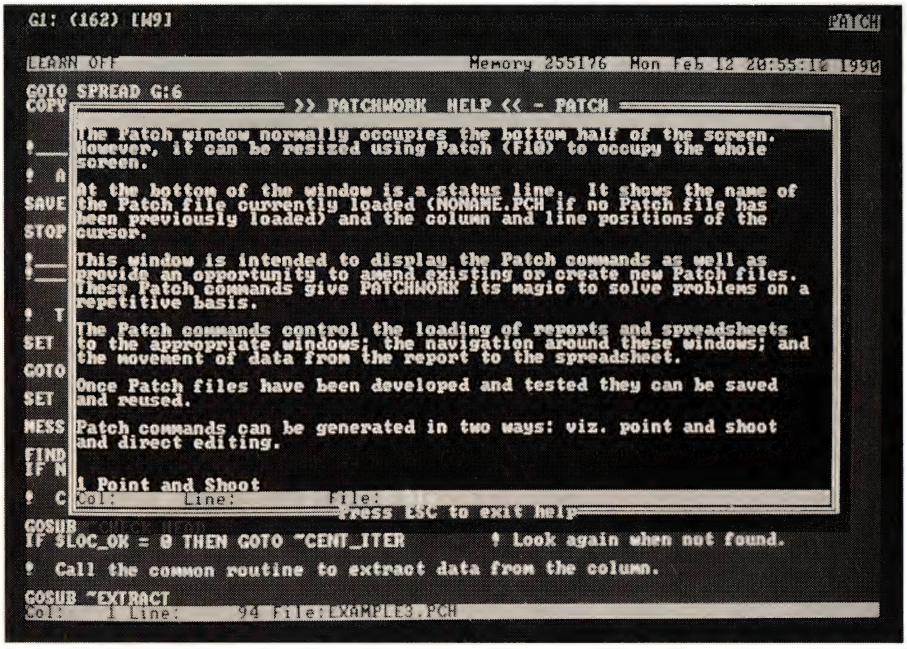


Patchwork's opening screen has three windows: the top left one displays the input report file; the top right, the output .WK1 spreadsheet file; across the bottom is a third window for the Patch file.



Patchwork and its Patch files solve a major problem in every organisation that has a mixture of PCs, minis and mainframes. The Patch file makes it easy to extract the right information from report after report, with little intervention by the user, and even less opportunity for error.

that the output from Patchwork can be used with most spreadsheets and many other applications.

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RELEASES FOR EDUCATION

New educational products from Dataflow, Ashton Scholastic, Jacaranda, Microsoft, Microbee and even the Australian War Memorial, are filtering into the classroom, as Sharon France reports.

Following the success of Where in the World?, Dataflow has released Where in Time is Carmen Sandiego?, adding a new dimension to the pursuit of the archvillain-ess and her gang.

THERE ARE MANY new products and projects, involving both software and hardware, which, although released late last year, will only start filtering into classrooms around the country early this year.

As of June, the new Microbee dual mode MS-Dos and CP/M computer, code named the 640TC Plus, should be available to schools. Announced and showcased at the National Conference in October last year, the 640TC plus is housed in the compact 256TC casing, but has a lot more technology under the cover than earlier Microbees. The machine breaks new ground with the ability to run both CP/M and Dos programs in an auto-switching mode. Standard features include 640K of memory, EGA graphics, parallel and serial ports, and mouse support.

This is Microbee's attempt to protect the huge base of installed Microbee units around the country (estimated at 75,000) and, according to Microbee's managing director, Giuseppe De Simone, the company also wants 'to protect the huge base of existing quality educational software for the Microbee while giving loyal users access to the full benefits of Dos. We've made the transition as inexpensive and simple as possible. Users can continue to use Microbee software they know and love while being able to take advantage of the growing library of Dos applications.'

The cost effectiveness ideal is also expressed in Microbee's resurrection of its 'upgrade policy'. For no more than $700, any Microbee user will be able to upgrade to the new system with recent purchasers given further price incentives. The upgrade will in fact be a complete system swap over – new for old.

Ever mindful of the origins of Microbee and the Australian 'home grown' image, Microbee's new management has been careful to maximise the Australian content of this new innovation. The case, the custom integrated circuit, and the BIOS, have all been designed and developed in Australia. The printed circuit boards will be manufactured in Australia, and the boards will be populated here as well, using advanced surface mounting techniques.

For further information about the 640TC, contact Microbee's head office on (02) 317 4033 or its Melbourne outlet on (03) 388 1311.

Gallipoli 75

THE AUSTRALIAN WAR Memorial is marking the 75th anniversary of the Gallipoli campaign with an array of exciting commemorative activities.

One of the core components, Gallipoli, A Resource Kit, includes reproductions of documents from the archives of the Australian War Memorial. The kit was provided free of charge to one thousand schools, and contained ideas on how to research what happened in 1915 in Australia and at Gallipoli. It also offered practical suggestions on presenting the results of student research.

A national computer database of Gallipoli soldiers is also to be complied this year by students from schools across Australia. It is aimed at senior primary to secondary students, and requires the contribution of biographical information on soldiers from their community who served at Gallipoli. The biographical entries will be based on a combination of official records provided to schools by the Australian War Memorial and material researched locally by students.

On April 25th, 1991, the database will be made available to schools and the public. For further information please write to Robin McLachlan, Gallipoli 75 Database Project, Australian War Memorial, GPO Box 345, Canberra 2601 ACT.

This year will see the introduction of 25 Technology High Schools throughout New South Wales. The idea is to provide new opportunities for detailed and high quality study of many aspects of technology, as well as extending the range of choices available to parents in selecting a school to meet the interests and needs of their children.

The funding for the school's new role and the necessary purchase of technology will come from local businesses. There will also be a strong link between the schools, sponsoring businesses and local TAFE colleges. For further information about the Technology High Schools and their locations, contact the head office of the Department of Education.

Ashton Scholastic

ASHTON SCHOLASTIC is launching into multimedia in a big way this year with the introduction of a number of interactive programs suitable for Apple II computers, and primary and secondary classrooms. Perhaps the most exciting is the release of HyperScreen for the Apple II range, which is a Hypercard work-alike. In essence, it allows teachers (and advanced students) to develop and produce interactive material on the computer, incorporating text, graphics and sound. There are numerous applications for such a versatile piece of software, including the development of alphabet stacks for kindergarten children and interactive courseware on current topics for senior students.

Also in Ashton's new bag of tricks is SuperPrint II, Graphics Bank II (new versions and releases with advanced features) and the tried and true favorites – Slide Shop and Super StoryTree. It's interesting to note the compatibility between many of these programs, allowing the user to swap graphics and import and export files into other programs to be fine tuned. For further information, contact Matthew Cross, Ashton Scholastic Software, PO Box 579, Gosford 2250 NSW.

Do you want to do something a little 'fishy' with your Year 3 or 4 class? Well, consider a new software release from Jacaranda Software – Kraken, A Deep-sea Quest, which is designed especially for use as part of a 'sea' theme. It provides dozens of jumping-off points for exciting activities in language, maths, science, craft and research work.

Ever mindful of the origins of Microbee and the Australian 'home grown' image, Microbee's new management has been careful to maximise the Australian content of this new innovation.

In this adventure, children use their problem solving skills to sail their research vessel around a map in search of the elusive giant squid – the Kraken. The program is accompanied by several documents including 48 pages of information and teaching ideas, a resource book for children titled *Fact or Legend,* an easy-to-read comic book introduction to the package Battle with the Kraken, and 13 reproducible activity sheets. The package priced at $72 and is available for the Apple II range (3½ and 5¼ inch), the Archimedes (3½ inch) and BBC (3½ and 5¼ inch). For further information about Kraken and a Jacaranda Software catalog, write to Jacaranda Software, PO Box 1226, Milton 4064 Qld.

Microsoft academic versions

MICROSOFT HAS always had a commitment to education as evidenced by their recurring attendance at computer education conferences. The release of their Academic Editions of Word, Works and Excel for Macs and IBMs, and Powerpoint for the Mac, reinforces this commitment and brings the purchase of the software to a price point accessible by teachers, educationalists, and students (tertiary and, it is rumored, soon-to-be secondary).

Microsoft is at pains to point out that the software is not crippled in any way, and not earmarked with 'undeleteable' footnotes proclaiming its origins. The differences lie in the manual's production (or binding) and the packaging. The software is the same as the full blown version, but cheaper. For example, a Mac user could purchase the entire suite of Academic Version software (Excel, Word, Works and Powerpoint) for only $609! Also, the packages are upgradeable to the full product when new versions are released.

A lasting advantage, pushed strongly by Microsoft, is that because the software is so affordable, users will benefit from buying the software and using the manual – thereby taking full advantage of all the features offered. It is undeniable that software piracy affects not only the little guys, but also the large software corporations, however, with the cheaper versions coming out, the excuses for this practice should ease off. For further information contact Microsoft on (02) 452 0222.

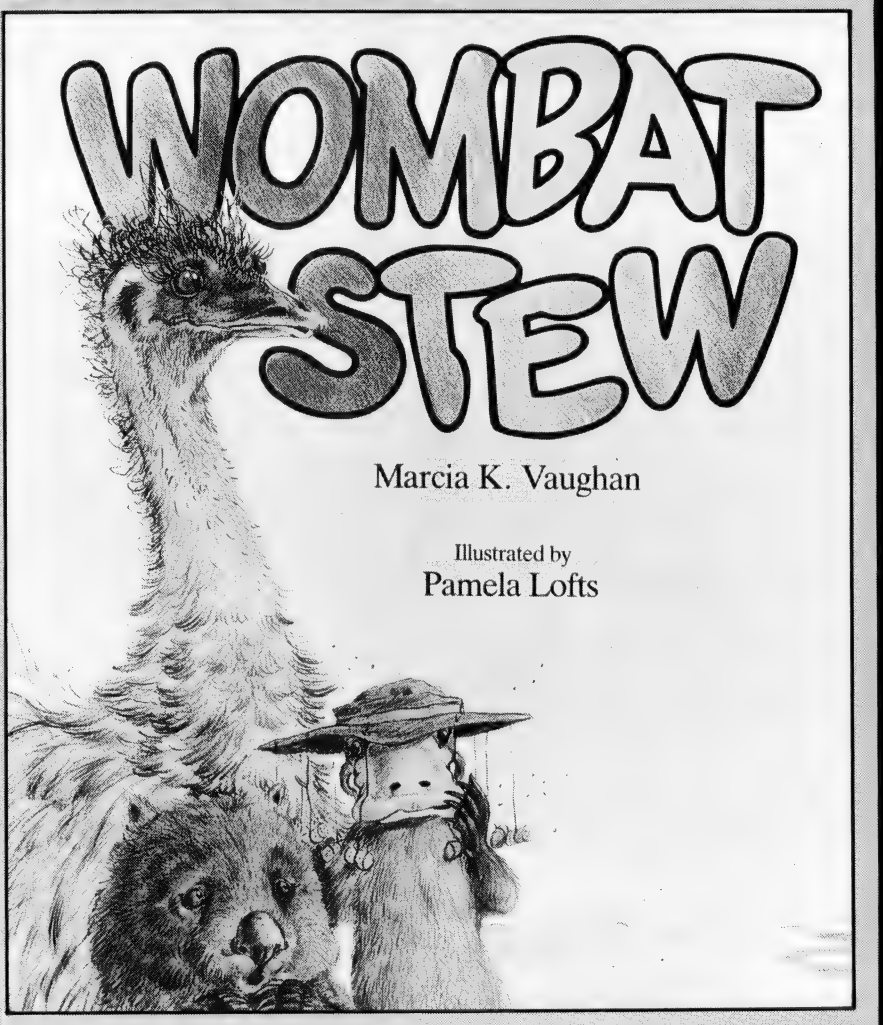
Chandler Software/Dataflow

MACSCHOOL, A COMPLETE school administration package, has expanded to include four new modules. Originally released in 1988, the basic program included modules on scheduling, attendance, marks, report cards, ASCII transfer and library management. Last October saw the release of three extra interactive modules under the umbrella of Fund Accounting for general accounting, purchasing and invoicing.

Also as part of the Fund Accounting package, the latest module releases include budget development, cash management, personnel and asset management, with a payroll module to be released in May this year. MacSchool is in a tough market, what with the establishment of OASIS for government schools in NSW, however, many private schools have turned to MacSchool to solve the complexities of administration and funding.

An exciting twist to the development of this software in Australia is that it is also taking off in North America. With the support of development and export initiatives offered by the commonwealth government, MacSchool should be well on its way to convincing international markets that Australia is a useful and innovative technological resource.

Wombat stew!



SOFTWARE COMPANIES are increasingly becoming more interested in schools' involvement in the development of new titles and support material. A splendid example showed itself recently: during the 1989 school year, Ashton Scholastic Software enlisted the enthusiasm of Mandy Minogue, a part-time computer consultant with the Catholic Education Office in the Canberra/Goulburn Archdiocese, to trial one of their new titles and develop teaching ideas and strategies.

Minogue has been teaching for eight years in primary schools, and introduced her Year 1 class (and other classes at St Bede's primary school) to Wombat Stew.

Wombat Stew is essentially a selection of graphics, directly drawn from the Australian picture book classic *Wombat Stew* by Marcia Vaughan and illustrated by Pamela Lofts. It is an add-on to the popular Graphics Bank II program (also produced and published by Ashton Scholastic Software) and is designed for primary schools, for use across the curriculum.

Minogue was supplied with a kit comprising the Graphics Bank II program, the Wombat Stew Graphics Library disk and picture book, some notes on operation, and she organised to borrow an Apple IIGS through the Catholic Education Office. Minogue decided to use a thematic approach to Wombat Stew and planned units of work, on and off the computer, to last one term. Due to an 'explosion of ideas' and the 'incredible enthusiasm' of the class, the unit lasted two terms.

Minogue started by reading and re-reading the book to her class. The children loved to hear it over and over again, and enjoyed making up their own rhymes. Within the next week, the computer and the Wombat Stew characters, in disk format, were introduced to the class. The children were so excited and enthused over being able to print out their favorite character and type captions and words on the screen.

By this stage, Minogue was totally enthused and had many ideas flowing through her head as to what could be done with the package, and where the class could go with language and other subject areas. During the Wombat Stew experience, the package was integrated into many curriculum areas including art and craft (the children made their own puppets, models and murals of billabong scenes), science (systems within animals were explored through dissection and discussion, animal tracks were investigated and reproduced, and animals were classified), social science (guest speakers from National Parks and Wildlife talked to the class), and mathematics (especially when children concocted their own Wombat Stews and weighed and measured the ingredients).

The most obvious application for the package, however, was in language arts. The program provides a link between reading, writing and children's literature. One of the features of the package is its ability to print Big Books. Minogue found that the children became enormously productive in this area – re-writing the story from another animal's point of view, writing new stories using a selection of the graphics and their own text, and so on. The older students produced Big Books for the younger classes which they presented themselves in a shared reading environment.

Perhaps the only obstacle Minogue found (besides running out of printer paper and having to deal with dead printer ribbons) was getting the children used to going into the program. Although Wombat Stew and Graphics Bank are menu driven, many of the children introduced to the software were pre-readers. This was overcome by the class learning a rhyme to get into the package. 'From there,' as Minogue puts it, 'it was full steam ahead!'

The Wombat Stew Graphics Library costs $39.95 rrp, and includes the Wombat Stew Graphics Library disk, the Wombat Stew picture book, and an easy-to-read manual. If you do not have Graphics Bank II, it can be purchased for $99.95. Wombat Stew Graphics Library is available in 5¼ inch disk format for Apple II computers. Optional 3½ inch disks are available for the GS, but are not GS specific.

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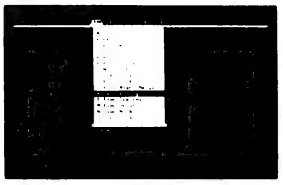

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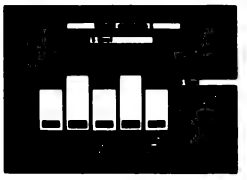

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As part of the Discovering Gallipoli project organised by the Australian War Memorial in Canberra, Susie Brazier, Wayne Nixon and Corey Tozer (all of the Tatton Public School in Wagga Wagga) investigated the Wagga Wagga Archives – research officer Jill Harris showed them holdings related to local soldiers.

For further information, contact Kathryn Try, Chandler Software, PO Box 968, North Sydney 2059 NSW; (02) 954 9119.

Where in the World? Where in Europe? Where in the US? Yes, all well known questions relating to the location of an infamous character by the name of Carmen Sandiego. One was wondering where she might be pulling her next heist – South America or Australia perhaps? But no, as you will find out from your local Dataflow software distributor, Carmen and her gang have taken to time travel. The latest release in this most popular series is Where in Time is Carmen Sandiego?, which takes you across the globe and through time. The interest generated by Dataflow's promotional competition at the National Conference, and the never-ending stream of sleuths trying to track time-traveler Carmen down at the Dataflow stand, indicates that this latest release will be another hit!

It is undeniable that software piracy affects not only the little guys, but also the large software corporations.

Publications

TWO PUBLICATIONS to look for early this year are *Computers in the History Classroom* (CDC, PO Box 34, Woden 2606 ACT; $25 plus $5 postage) and *Using the Apple Computer for School Publishing* by Pete Dailhou ($2.75 from JPR Software or contact Apple Australia). Both contain fabulous teaching ideas and strategies for use in your classroom. □

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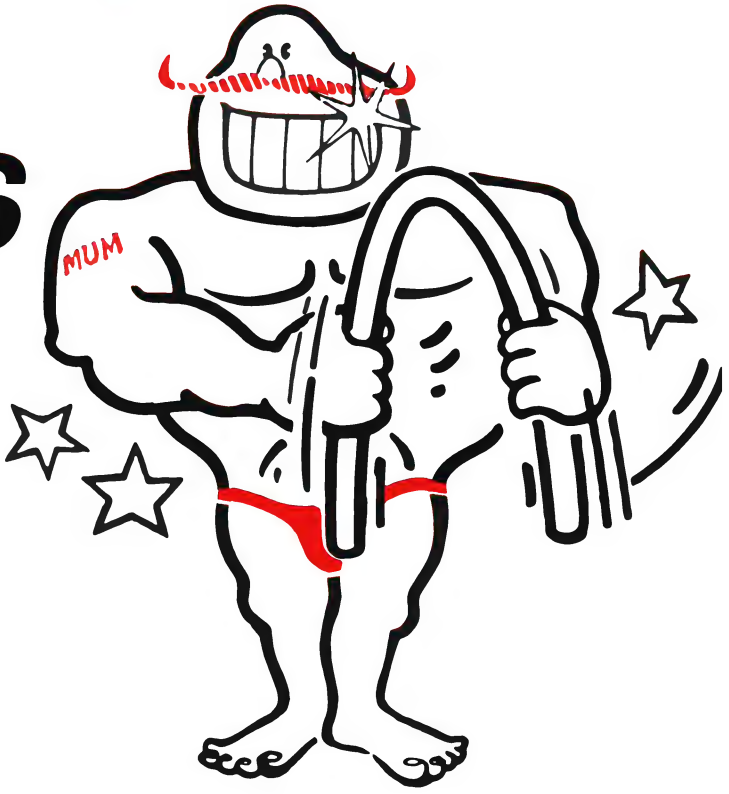

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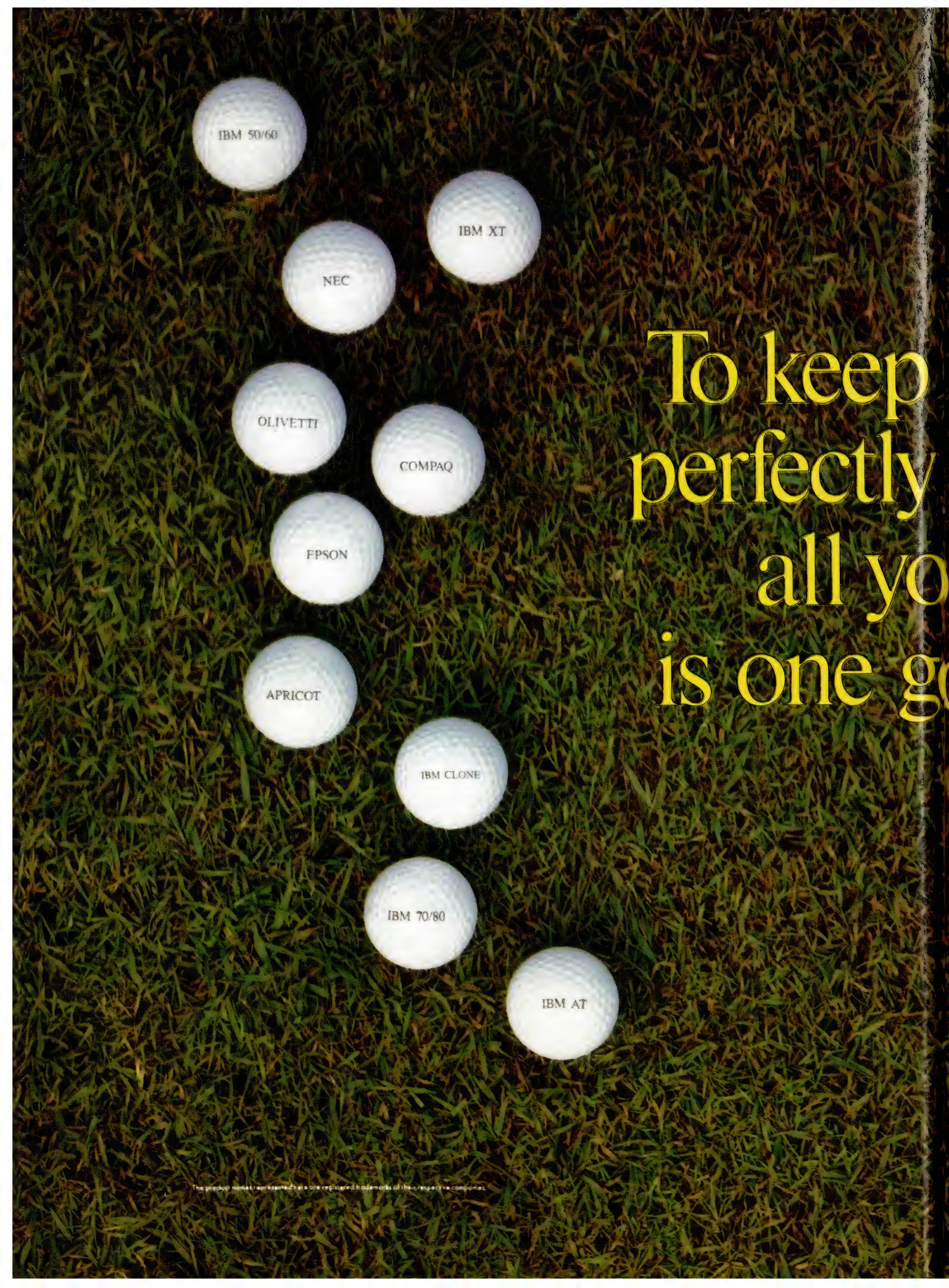
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TIMER ON YOUR HANDS

Ever been frustrated by Basic's non-random Randomize? Pat Murphy tells how to give RND respectability . . .

THE LITTLE known Basic command Timer, can be both amusing and powerful to use. The Basic command Print Timer will display the number of seconds (to two decimal places) that have elapsed between the previous midnight and the instant you press the return key. At first sight, this may not seem a very useful facility, but it's not until you see it at work in a program that you realise just how useful it can be. On a light-hearted note, how about your own Lotto Quick-pick? Remember, when entering these compressed Basic programs, allow the computer to 'wrap around', that is, only press the enter key when you want to start another line number.

```
10 CLS:PRINT,"FOR SIX LOTTO NUMBERS":PRINT:INPUT "ENTER YOUR
LUCKY NUMBER";N
20 PRINT:RANDOMIZE TIMER*N:FOR J=1 TO 6:X=RND*44:PRINT
INT(X+1);:NEXT J:PRINT:PRINT:INPUT "PRESS ENTER FOR FURTHER LUCKY
NUMBERS OR F TO FINISH";X$:IF X$="" THEN 20 ELSE END
```

Standing alone, Randomize does *not* generate a random number. It is totally predictable. The marriage of Randomize and Timer gives an air of respectability to RND, together with some of the unpredictability of a good marriage or a true random number. As a fringe benefit, it also gets rid of the annoying pause in Randomize while you think of a seed number.

Anybody working with community groups will have at sometime or other cursed the job of folding all those ticket stubs to find the winner of a raffle. The following program is tailored to the standard, vari-colored, one to 100 books of raffle tickets. Again, by using Timer with Randomize, the program does not halt while you think of a seed number to enter. Although this is designed for up to five different colored books, it can be expanded to any number of books.

```
10 CLS:PRINT TAB(15)"THIS PROGRAMME RANDOMLY SELECTS RAFFLE
TICKETS":PRINT:PRINT TAB(5)"The work in folding duplicate ticket
stubs for 'drawing out of the hat'is":PRINT"eliminated using this
programme. It will accomodate up to five colours."
20 PRINT:INPUT "ENTER NUMBER OF BOOKS SOLD";NB
30 IF NB=1 THEN 180
40 IF NB=2 THEN 100
50 IF NB=3 THEN 120
60 IF NB=4 THEN 140
70 IF NB=5 THEN 160
80 IF N<0 OR N>5 THEN 90
90 PRINT:PRINT "THIS PROGRAMME CATERS FOR 1 TO 5 BOOKS
ONLY.":GOTO 20
100 PRINT:PRINT "ENTER COLOUR OF BOOKS WITH A COMMA BETWEEN EACH
ENTRY";C1$,C2$
110 PRINT:INPUT C1$,C2$:GOTO 180
120 PRINT:PRINT "ENTER COLOUR OF BOOKS WITH A COMMA BETWEEN EACH
ENTRY";C1$,C2$,C3$
130 INPUT C1$,C2$,C3$:GOTO 180
140 PRINT:PRINT "ENTER COLOUR OF BOOKS WITH A COMMA BETWEEN EACH
ENTRY";C1$,C2$,C3$,C4$
150 INPUT C1$,C2$,C3$,C4$:GOTO 180
160 PRINT:PRINT "ENTER COLOUR OF BOOKS WITH A COMMA BETWEEN EACH
ENTRY";C1$,C2$,C3$,C4$,C5$
170 INPUT C1$,C2$,C3$,C4$,C5$
180 RANDOMIZE TIMER:NUM=INT(RND*101):IF NUM<1 OR NUM>100 THEN 180
200 COL=INT(RND*NB+1):IF COL=1 THEN 250
210 IF COL=2 THEN 260
220 IF COL=3 THEN 270
230 IF COL=4 THEN 280
240 IF COL=5 THEN 290
250 PRINT:PRINT"THE WINNER IS ";C1$;" TICKET NUMBER";NUM:GOTO 300
260 PRINT:PRINT"THE WINNER IS ";C2$;" TICKET NUMBER";NUM:GOTO 300
270 PRINT:PRINT"THE WINNER IS ";C3$;" TICKET NUMBER";NUM:GOTO 300
280 PRINT:PRINT"THE WINNER IS ";C4$;" TICKET NUMBER";NUM:GOTO 300
290 PRINT :PRINT"THE WINNER IS "C5$;" TICKET NUMBER";NUM
300 PRINT:PRINT"PRESS ENTER FOR NEXT WINNER OR ENTER F TO
FINISH";:INPUT IP$:IF IP$="" THEN 180 ELSE END
```

On a more serious note, many years ago 'benchmarks' were devised to assess the CPU speed of a computer. These comprised a set of mathematical problems each of which had to be processed 1000 times. How many seconds this took was a measure of the computers speed.

The following program uses Timer to force a computer to time its own performance in computing eight tests. The speed for each test is shown together with the average for the eight tests.

```
10 CLS:PRINT TAB(30)"COMPUTER ANALYSIS":LOCATE 3,5:PRINT"This
programme will use the computers own clock to time its
performance."
20 PRINT"Please understand we are only testing the 'MATHMATICAL
SPEED' of this computer, not its other capabilities."
30 PRINT TAB(5)"These eight tests start with simple counting from
1 to 1000, and progress";:PRINT"through increasingly more complex
calculations."
```

```
40 PRINT TAB(5)"The print-out is the speed in seconds for each
test with the average";:PRINT"given at the end. The average is a
measure of this machines speed in dealing";:PRINT"with any
MATHMATICAL problem."
50 PRINT TAB(12)"Please be patient, this could  take one or two
minutes.":PRINT TAB(12)"Don't forget that each test is repeated
1000 times."
60 T1=TIMER:FOR K=1 TO 1000:NEXT K:T2=TIMER:RES1=T2-
T1:PRINT:PRINT USING"###.###";RES1;:PRINT" secs.  ";:T1=TIMER:K=0
70 K=K+1:IF K<1000 THEN 70
80 T2=TIMER:RES2=T2-T1:PRINT USING"###.###";RES2;:PRINT" secs.
";:T1=TIMER:K=0
90 K=K+1:A=K/K*K+K-K:IF K<1000 THEN 90
100 T2=TIMER:RES3=T2-T1:PRINT USING"###.###";RES3;:PRINT" secs.
";:T1=TIMER:K=0
110 K=K+1:A=K/2*3+4-5:IF K<1000 THEN 110
120 T2=TIMER:RES4=T2-T1:PRINT USING"###.###";RES4;:PRINT"
secs.":T1=TIMER:K=0
130 K=K+1:A=K/2*3+4-5:GOSUB 260
140 IF K<1000 THEN 130
150 T2=TIMER:RES5=T2-T1:PRINT USING"###.###";RES5;:PRINT" secs.
";
160 T1=TIMER:K=0:DIM M(5)
170 K=K+1:A=K/2*3+4-5:GOSUB 260
180 FOR L=1 TO 5:NEXT L:IF K<1000 THEN 170
190 T2=TIMER:RES6=T2-T1:PRINT USING"###.###";RES6;:PRINT" secs.
";
```

```
200 T1=TIMER:K=0:DIM P(5)
210 K=K+1:A=K/2*3+4-5:GOSUB 260
220 FOR L=1 TO 5:P(L)=A:NEXT L:IF K<1000 THEN 210
230 K=K+1:A=K/2*3+4-5:GOSUB 260:
240 FOR L=1 TO 5:P(L)=A:NEXT L:IF K<1000 THEN 230
250 T2=TIMER:RES7=T2-T1:PRINT USING"###.###";RES7;:PRINT" secs.
";:GOTO 270
260 RETURN
270 T1=TIMER:K=0
280 K=K+1:A=K2:B=LOG(K):C=SIN(K):IF K<1000 THEN 280
290 T2=TIMER:RES8=T2-T1:PRINT USING"###.###";RES8;:PRINT"
secs.":TX=RES1+RES2+RES3+RES4+RES5+RES6+RES7+RES8:PRINT:PRINT"Eight
thousand calculations in";TX/8;"seconds.":IF TX/8<8 THEN 330
300 IF TX/8>20 THEN 340
310 IF TX/8 >8 OR TX/8<20 THEN 320
320 PRINT"There are reasonably priced machines that are
faster.":GOTO 350
330 PRINT "This is not bad for a PC.":GOTO 350
340 PRINT"This is a little slow if you do a lot of
calculations.":GOTO 350
350 PRINT:PRINT"Remember the lower the number, the faster the
computer.":PRINT"Now try another machine and compare the
results.":END
```

With these three simple programs as a base, you can build on the Timer and Randomize Timer commands to produce many useful utility programs. In fact you have 'timer on your hands'. □

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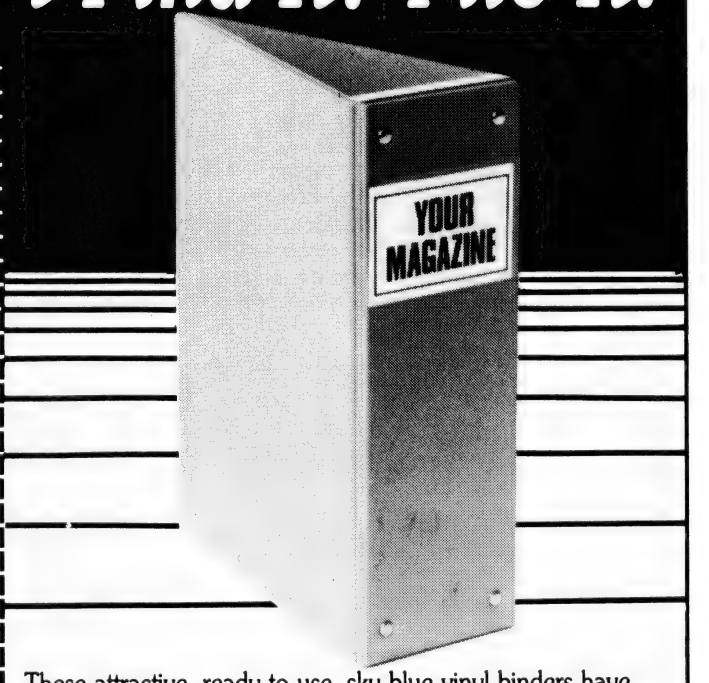

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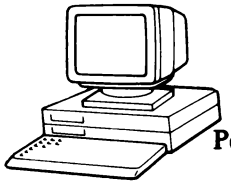

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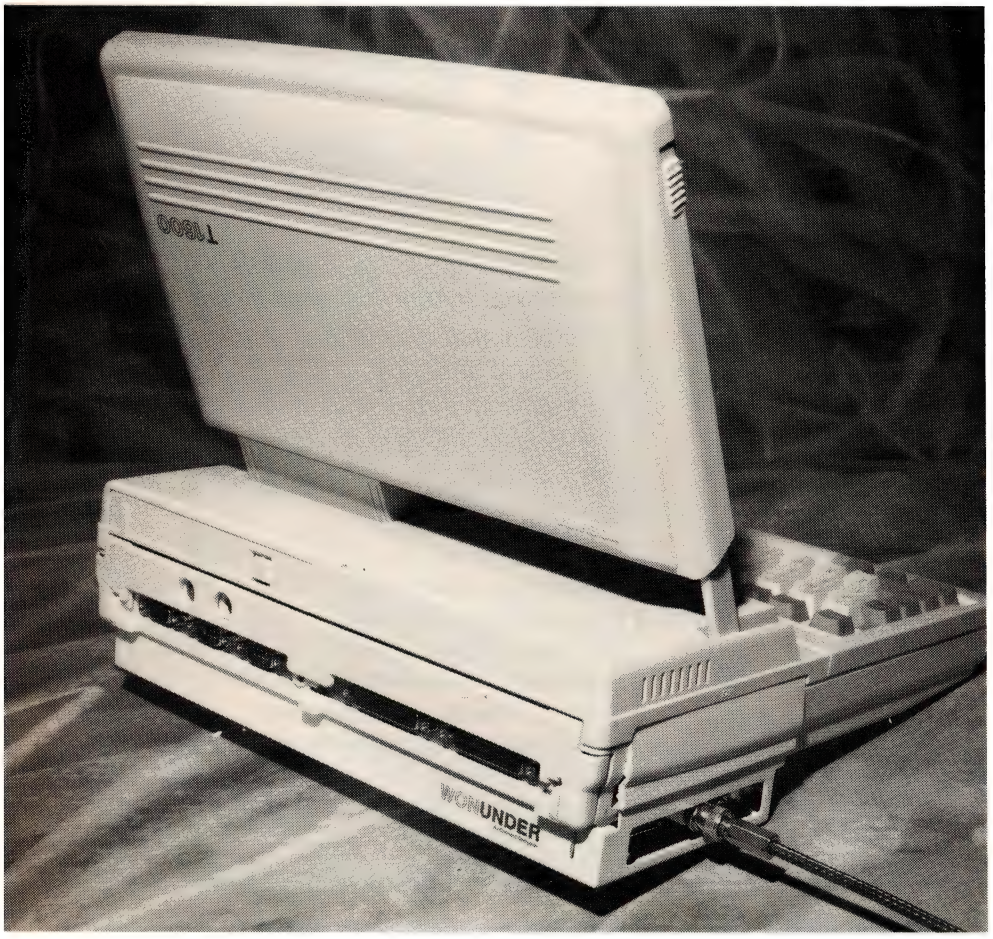

Like to expand your laptop or notebook, or even replace your desktop PC? Read on . . .

SYDNEY-BASED Xltech has released an expansion unit – WonUnder – for Toshiba laptops that will be the answer to many an owner's prayer. (Toshiba themselves recently announced clip-on expansion units for the range, but they are not likely to be available until late this year – Xltech's product is authorised by Toshiba, incidentally.) WonUnder is a compact single-card expansion unit for 8-bit cards, that clips under the laptop. It's priced at $680. The unit is passive, so almost any standard card will work with it.

The WonUnder has been for sale in the US for sometime, and a number of interesting applications have come to light. For example, technicians at Disneyland are using a WonUnder with a data acquisition card and an accelerometer to measure the forces generated by amusement rides. Of course, the expansion unit supports MIDI (Musical Instrument Digital Interface) cards – a musician who commutes between the east and west coast of the US can now spend the time on planes writing musical scores. And – an educator is using the WonUnder to translate English to Chinese characters (we were unable to discover what card he was using).

Two other interesting applications are voice character recognition for the blind, and measuring cardiovascular activity in dogs.

On a more mundane level, the first success of WonUnder in Australia was with sales reps who are rarely in the office. They are using the chassis to fit a fax or modem card to their Toshibas, allowing them to stay in constant touch with head office.

Office staff at Xltech have found a use for the expansion themselves: the sales manager has a T5100 and is using WonUnder with an Ethernet card to connect to the office Novell network. He also uses it in conjunction with a video camera adapter card for demonstrating an image capture application.

Xltech has also released two other portable expansion units. For expanding the notebooks (the T1000XE and T1200XE), the Cradle takes a single expansion card.

Technicians at Disneyland are using a WonUnder with a data acquisition card and an accelerometer to measure the forces generated by amusement rides.

This unit is expandable in length so it can be used with either 8- or 16-bit cards. Current uses for it include network interface cards, cards for mainframe emulations, communications, graphics and additional memory. The small size of the Cradle means that even with it attached, the notebook will still fit in the standard Toshiba carry case. The unit is priced at $680.

The other expansion unit from Xltech is the Stratum Expansion Chassis. It's for those who would like more flexibility in their laptop, and would even like to be rid of their desktop machine. The Stratum is a multi-slot expansion unit that can hold up to five full length cards. It works with the Toshiba T1200, T1600, T3100 and T5100 as well as laptops from Compaq, Zenith, Epson and Mitsubishi.

If you'd like more information, contact Xltech on (02) 975 2111 or fax them on (02) 975 2167. □

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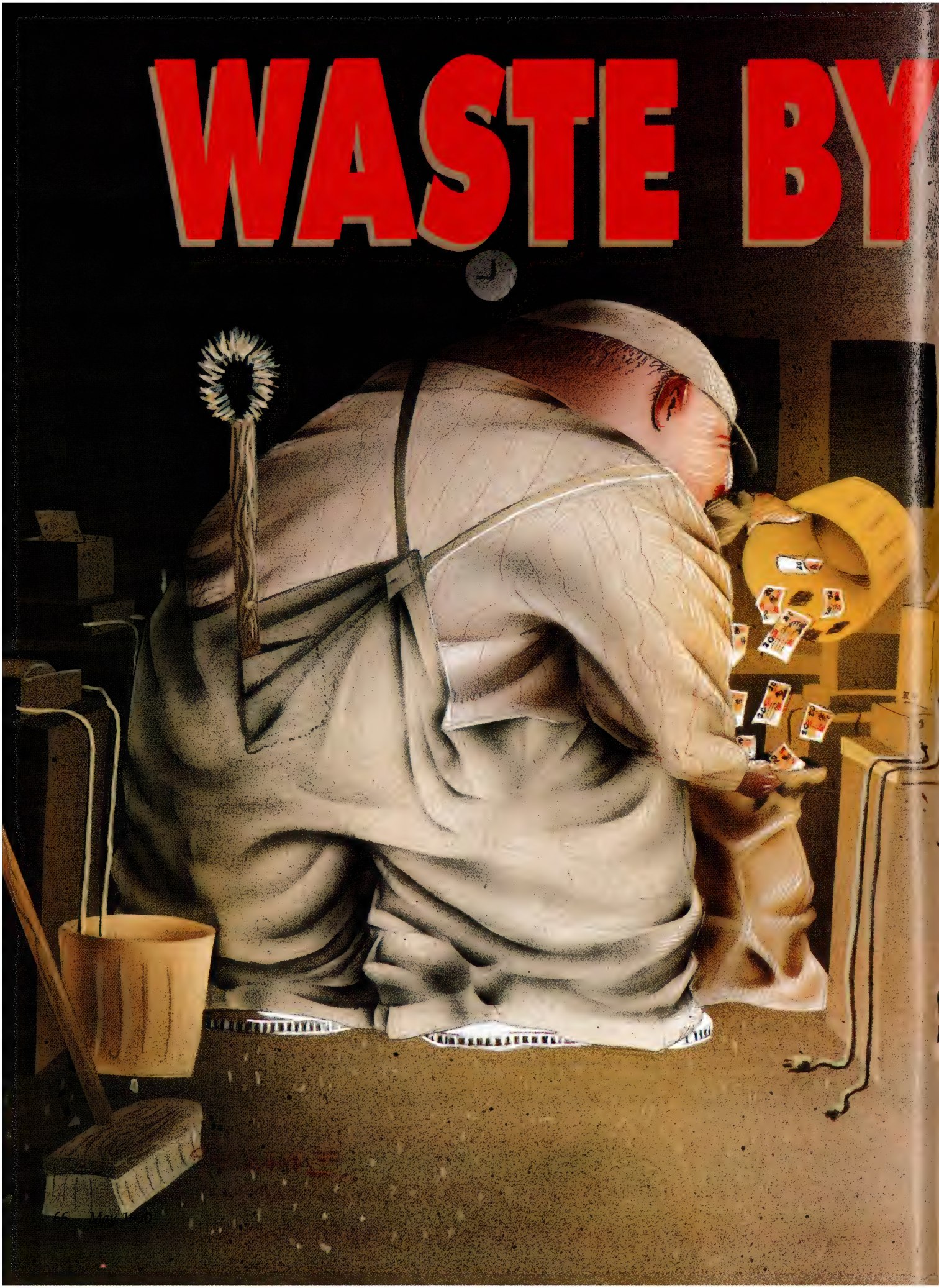
WASTE BY

COMPUTER

Have you ever thought of how much money is wasted in the name of 'computerisation'? Here are the views of a former public servant who helped . . .

IN AUSTRALIA TODAY, the misuse of computers by government and private companies is costing the economy millions of dollars. I should know. I've helped them do it for as long as I can remember. The federal, state and local governments of Australia are the main offenders. Private companies and corporations are also at fault, but to a much lesser degree. The confirmation of this statement can be seen daily at your local Telecom, Australia Post, *any* bank, building society or credit union office. More inefficiency exists in electoral rolls (in Queensland they don't even know who is on the roll), electrical authorities, road and water boards, city, town and shire councils. The many deficiencies in basic software and hardware are costing the taxpayer a small fortune, as well as adding to the country's deficit problem.

Misguided public servants, in particular, are the villains of the piece. There are literally hundreds of federal, state, and local government senior managers, who know nothing of their own department's computer needs or requirements. Those managers that do know are finding their hands tied by budgetary constraints. The term *in-house* has become common place within government circles, and translated, means 'We don't *really* know our requirements, but we don't want anyone else to find out either'.

Evidence of misspending on hardware and software is quite open. Newspaper reports are turning up daily of management gaffs in relation to hardware and software purchases. From the DCA's air traffic controllers (I won't mention pilots), to hospital boards, cock-ups are happening at an alarming rate. The police, road authorities, essential services, emergency services and other government controlled bodies, are finding out the hard way about bad purchasing errors and lack of long range planning.

Senior management is responsible for most of these gaffs, but can take some solace in the fact that they are being poorly advised, poorly educated, and have the current weight of the economy against them. Let's face it, there isn't a senior manager today who used, or was taught how to use a computer at school. Sure, re-education schemes can help, but either the individual is interested or could not be bothered, and has decided to let 'Smith' handle the computer side of things. You know Smith, he's the bloke that always knows the answer to your problem, but hasn't got the time to show you! It's the Smith of most corporations who cause the greatest amount of lost productivity and lost revenues.

The professionals

IF THE BLOODY roof leaks, get a plumber. Senior management does not appear to be willing to seek professional advice when it comes to computers. The high cost of such advice is certainly a good deterrent. Perhaps there is a mini solution for both factions right at this point. Australians have never been good at paying for advice. If the plumber tells me how to fix the leak, you won't see me reaching for my wallet.

Computer experts are pros at what they do, are educated and trained to do their job, and therefore, should be the ones employed to fix *computer* problems. Most state, and local governments do not employ full-time computer professionals as such. Instead, they use their in-house people, or employ people with dual qualifications. Both of these solutions are unsatisfactory. The larger government departments with computer branches find them so bogged down with large, on-going projects, that they cannot spare any experts, even temporarily.

The computer industry itself isn't one to volunteer free advice on anything to anybody. Then again, most government departments don't really know what they want. Those that have established a corporate plan of some description, find that only a handful of individuals know of the plan and what its aims entail.

Whether you are a small business, large company, or government authority, professional advice will pay for itself down the road. Another bonus is the cost saving in obtaining the advice right *now* and not two or three years down the track, when wages and consultant fees really will approach an unreasonable amount.

Computerisation of a medium/large company is never going to be an easy problem to solve, mainly because of the high number of variables. A typical in-house technique used by the government is to develop its own software by a whole bunch of people like good old 'Smith'. Not only does the software not work, but it takes years (not months) to develop. By the time it works, it's due for replacement because of a hardware or policy change.

Programming is for *programmers,* not clerks, engineers, architects, lawyers, surveyors or any other dummy who thinks his prized Basic program is going to solve the company's productivity problem. Incorrect hardware is another classic government blunder. A short walk into any local or state government authority will see them struggling with floppy discs, manuals, computers, printers, modems, terminals and networks. There is a definite lack of on-going training.

Australia's educational system could very well be the source of misuse. Australian educators suffer from the 'catch up' syndrome when it comes to computers. As quick as the educators decide on a syllabus, books and programs, new innovations in the computer industry outdate them. A short term solution is to keep up with new hardware and software in our schools, colleges and universities. I can't see a long term solution until new technology itself slows.

Simple rules

STEMMING THE FLOW of lost taxpayer's dollars will have to start at a federal level, filtering right through to local authorities.

The *rules* are simple. Get some *professional* help – get the right man for the job. As soon as senior management does this, we might see some changes take place. What to do with incorrect or unusable hardware? *Sell it off* to educational institutions perhaps. At least this might be a good starting point (the schools will have to get rid of their old computer systems, first). Our primary and secondary educational systems are also included in the 'misuse' category (even though they struggle with limited budgets).

Does the federal minister for education have a corporate plan or computer strategy? If he has, it isn't being implemented properly. How do I know? I went to my offspring's school this morning! Although, any school will do. The teachers do their best with equipment they know is inadequate. A recent electoral speech in Queensland promised extra funds for P&Cs in state schools for computer equipment purchases. Now, that's *good* government planning and strategy, isn't it?!

Communications between government departments is minimal. That is why we have what I call 'triplication' (we are way past duplication). How many times does the taxpayer have to see government departments making totally independent purchases from software suppliers. A recent Queensland government department computer magazine was published with advice on five different spreadsheets. Does this mean that the department is using five separate spreadsheets? *You're damn right it does!* There has been trouble within that Department exchanging files. Now I wonder why that is?

Government departments (quangos included) with similar computer needs often purchase completely different hardware systems. Is there something fishy here? You bet there is. Check the Sydney, Melbourne, Brisbane and Perth papers for government hardware contracts.

Mind you, there are some private sector companies, in my opinion, who have missed the boat as well. But, they have a tendency to go broke if their computer problems aren't fixed straight away, rather than digging into the public purse. Maybe the computer professionals could show the public sector the best private company computer systems and why they work properly.

Benefits

IT'S OBVIOUS THAT Australia imports nearly all of its hardware and software, partly because Australian senior management hasn't sorted out its own present and long range computer needs. When they do, the realisation might come that there is top quality software and hardware to be bought right here in Australia. Our computer manufacturing industry *is* struggling to keep prices competitive with the Japanese and Americans. A good solid injection of taxpayers funds may get our industry on the road and help our balance of payments problem.

Purchasing the right hardware for 'the job' can be sorted out by a pro, once he's determined the software needs of a company. All Australian States would be able to slash their long term computer budgets by some sensible hardware purchases. The public might enjoy some increased efficiency as a result. How often do we here the words ... 'Sorry sir, our computer's down'. Down! Down where? Where's it gone? Why doesn't it work? The other classic line ... 'Our printer doesn't seem to be working today', may become a thing of the past (not always, though). I have seen several state government departments in the position of not being able to provide hard copy because ... there is no paper, no ink ribbons, incorrect set up strings on printers, incorrect cabling, cables not fitted properly, incorrect fonts, incorrect printing widths, and a multitude of others.

Apart from increased efficiency, we might see some genuine productivity. Let's face it, computerisation hasn't made our clerical work that much quicker to date. In fact, most organisations appear to go through an 'O' curve. Once the staff is finally competent with the hardware and software, management doubles the information required. Hence we go back to the origin point of our productivity ... the 'O' curve. Why we have to produce all this useless information in the first place defies logic. Thank goodness we now have discs to store it all on. Imagine the overload of paper we would have without it. The greenies would be smothered by tons and tons of useless information years ago. At least now, we have tons of useless information on hard discs, tapes and floppies.

Maybe next time I go into a government department or private company and see them struggling with the software, hardware, and peripherals, I can bite my lip and not roll my eyes in wonder. After all, look at the *trees* the Government has saved by misusing all these computer systems. We aren't getting any production so therefore there is less hard copy being churned out ... maybe it's a well thought out government policy after all! □

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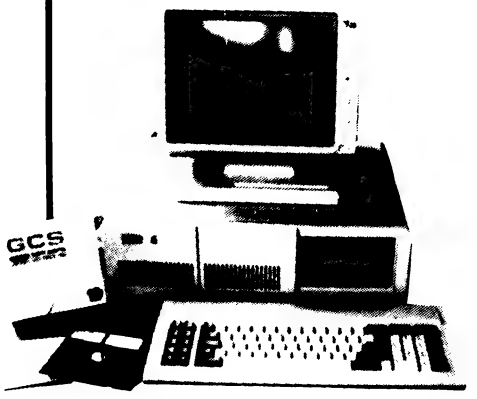

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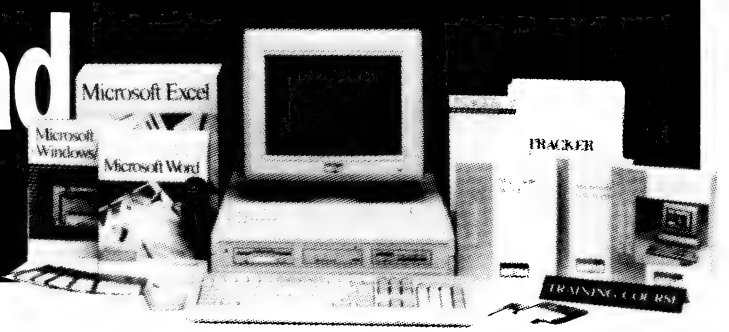

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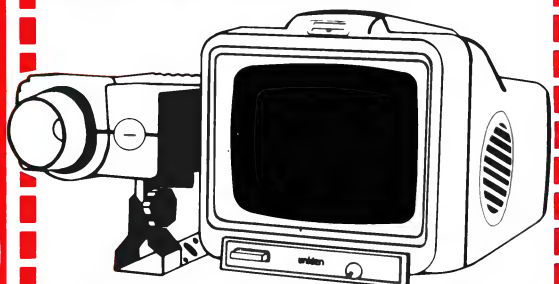

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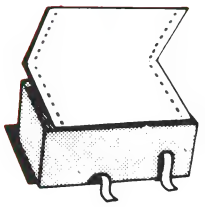

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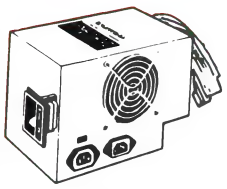

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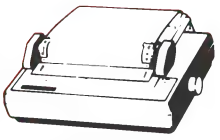

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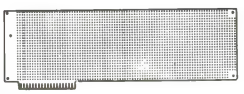

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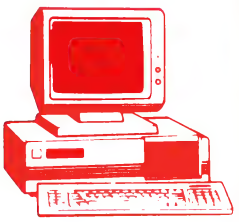
COMPUTERS



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- Keyboard port

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- Phoenix BIOS or Award
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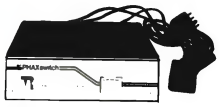

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- Allows 2 PCs to share one laser
- Serial model: MS-201 - Host-powered

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Response Time: 10ns
Protection Level: 350V peak

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LARRY LEWIS

The Prophet passes

IN MY MARCH and April columns I mentioned that the files SysOp Twits and User Twits were obtained from the Black Hole BBS. Some people seem to have taken the reference to mean that I was saying that Ken Thompson, who operates the Black Hole, is a twit.

Although I did do some changes and additions, the text of these two articles was obtained courtesy of Ken – there, I have said it.

If you remember back to my February article, I reported that Eastwood BBS, run by Mick Stock, was closing down. After a number of hardware problems and general apathy, Mick decided that it just was not worth it.

Unfortunately, Prophet had been heading the same way for a number of months when Mick announced his intention to close up shop. My wife Helen and I have been discussing, on and off, the amount of work that was being put in and the money that was pouring out from running the system.

Finally, on the first of March we had decided enough was enough and that it just was not worth the effort considering the amount of abuse we were receiving. Not that I want to totally bore you to tears, but how about we go through some of the major issues that finally resulted in the decision to shut down? Please note these are presented in no order.

There were a lot of brave people who had been logging on with false names and leaving message after message of filth.

Problems!

OF LATE (like the last six months) we have had a number of problems with people, and if you saw them in public, you would cross the street to avoid them. One guy (yeah, we know who he is) started to make interesting phone calls at all hours. Pity I'm not a lawyer, his messages would be enough on their own, I suspect, to at least have him charged with something. Then, there were a lot of brave people who had been logging on with false names and leaving message after message of filth.

Long-time Prophet users will be aware that I have been having continual problems with the quality (or lack of it) of my telephone lines. At times, even trying to talk to someone would require shouting.

After putting up with the run around for over a year, I finally complained to a district manager and demanded that something be done. I was promised that *some* action would be taken. It sure was. Whoever the officer was in Telecom that finally received the matter (they will not tell me), instead of trying to fix the problem, advised my local council that I was carrying on an illegal business in my home!

So, an inspector from the council contacted me and I explained what Prophet was all about. The result? Non-interest, nothing to do with council. Naturally, I rang Telecom and had quite a few words to say (again). You would think that for the average paper pusher that would be enough. But no, this defender of council planning laws wrote to the council, what exactly was said in that letter who knows, but lo and behold, the inspector now has to inspect my home to ensure that I was telling the truth. I must say it only took him about 10 minutes before he decided that he had better things to do and would tell Telecom in writing that the council was not interested.

I can tell you it is quite distressing to be told you are performing an illegal activity and have people inspecting you. It is insignificant as to whether you are innocent or not – you still feel 'pressured'.

Complete BBS Registry Listing

WE PUBLISH THE COMPLETE listing for the ACT and New South Wales in July, October, January and April; the listing for Victoria, Tasmania and the Northern Territory in August, November, February and May; and South Australia, Western Australia and Queensland in September, December, June and March.

Registration of Bulletin Boards are only accepted electronically at the primary electronic collection points – please address all enquiries through them.

And, as if that wasn't enough. Well, one of the 'technician type' rang up saying that he had 'tested' the lines and there was nothing wrong. If you want better, you better pay up and install FAXStream because they don't have to do anything about the quality of your lines.

This guy had performed what is known in the trade as a 'battery' test – all that this ensured was that the voltage could get up and down the line.

So, I rang the district manager (quite a few times), and finally, some technicians turned up and did a few more tests. Mind you, the problems had been reported a number of times, but they did some more tests rather than just fix the problem.

I then got a call from an engineer. I asked whether FAXStream would do any good (after explaining what it was that Prophet does), and basically, the answer was that installing it would be a waste of money (my money of course) as it would not help incoming calls at all (unless the caller also had FAXStream), and if the cabling between the exchange and Prophet was the trouble, it would do zilch!

Hardware

EXCEPT FOR the help of Compaq, Prophet would have died with all the equipment that fried when a power station blew. Insurance? 'No,' I was told, 'we don't cover that because you would have to prove to us that the voltage did cause it.'

After the debacle of a previous sponsorship, I had decided that I would never put Prophet in the position where it was at the mercy of some commercial supporter. If the people using Prophet didn't want to support it, then we would just have to close down.

As the continuing running costs were far in excess of what memberships were being received from the loyal supporters, and I am not a wealthy person, the obvious result was that we were losing money. This had only been sustained in the past because both Helen and I worked – basically, Helen's pay was funding the BBS.

We started verifying all callers to Prophet late last year, we had to as the number of false names were ridiculous, Helen was spending between two and three hours each day ringing users to verify them. About three out of 10 were false names.

A number of users (mainly *non-members*) were very pushy about getting instantaneous response to questions that they posted to me. As an example, in one week I had about 20 messages asking what an LZH (or ARC, ZIP) file was, even though in the help area was all the information you could ever want (and it was even mentioned in the log-on news file).

Generally, if I was asked the same question more than once I built a self help file for the topic, only problem is that people thought it was easier to make me answer the question for them rather than them putting in some effort.

When you have in excess of 3,000 callers and a system averaging more than 200 calls a day, you can't possibly take the role of educator for them all.

Oh well, enough of my bleating. Unless someone comes up with the dollars, Prophet as a publicly available, multi-line system will be no more. □

Primary electronic collection points

ACT – PC Exchange RIBM (062) 58 1406

NSW – Prophet TBBS (02) 628 5222

Vic. – Custom Programming Opus (03) 848 3331

Qld. – AMPAK Opus/PRBBS (07) 263 7070

SA – Oracle PC-Network (08) 260 6222

WA – Nemo Multiple BBS RAPL (09) 370 1855

Tas. – Hobart Users Bulletin Board (002) 43 5041

BBS Listing 9003

Sun 4 Mar 1990

New systems: 16
Online: 5
Unknown: 3
Offline: 14
Name Change: 4
Amended: 29
Total Systems: 409

VICTORIA

ABE Opus
Sysop: Doug Gordon
Phone: (03) 808-3599
Baud: V21 V22 V22bis V23
Access: Reg
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

Advance BBS
Sysop: Lex O'Connor
Phone: (03) 585-0284
FIDOnet: 3:636/404
Baud: V21 V22 V22bis
Access: Public
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

AIM - A)ccess I)n M)elbourne
Sysop: David Hellwege
Phone: (03) 592-3338
FIDOnet: 3:634/380
Baud: V22bis HST
Access: Public
Computer: IBM AT Clone
DOS: MS DOS
BBSoftware: PCBoard

AmigaLink
Sysop: Bohdan Ferens
Phone: (03) 792-3918
OZnet: 7:833/324
Baud: V21 V22 V22bis V23
Access: Mem LVA
BBSoftware: Opus

AmigaLink II
Sysop: Gary Gajic
Phone: (03) 376-6385
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: IBM XT
DOS: MS DOS
BBSoftware: Opus

AMNET
Sysop: Peter Hallgarten
Phone: (03) 366-7055
FIDOnet: 3:635/502
Baud: V21 V22 V22bis V23
Access: Mem Reg VA
Computer: Pulsar 386
DOS: PC DOS
BBSoftware: Opus

Andy's BBS
Sysop: Andrew Gulovsen
Phone: (03) 359-6378
FIDOnet: 3:635/503
Baud: V21 V22 V22bis V23 V32
Access: Public
Computer: XT Clone
DOS: MS DOS
BBSoftware: Opus

Antarctic Crystal
Sysop: Greg Jones
Phone: (059) 68-5885
OZnet: 7:831/346
Baud: V22 V22bis V23
Access: Public
Computer: IBM AT Clone
DOS: PC DOS
BBSoftware: Opus

ANZUGS CBCS
Sysop: Gordon Castle
Phone: (03) 563-2496
OZnet: 7:833/380
Baud: V22bis PEP
Access: Public
Computer: IBM Model 80
DOS: PC MOS/386
BBSoftware: Opus

Arcadia Opus
Sysop: Andrew Newbury
Phone: (03) 267-8793
FIDOnet: 3:634/385
Baud: V21 V22 V22bis V23
Access: Public
Hours: Phone number changing to(03) 867-8793 on 1st May 1990
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

AUSOM Macboard
Sysop: Ross Sheehy
Phone: (03) 587-4360
Baud: V21 V22 V22bis V23 V32 B103 B212
Computer: Macintosh
DOS: HFS
BBSoftware: Red Ryder Host

AutoShop BBS
Sysop: The Mechanic
Phone: (03) 720-6415
FIDOnet: 3:636/501
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Axiom BBS
Sysop: Andrew Rajcher
Phone: (03) 509-4417
FIDOnet: 3:634/388
Baud: V21 V22 V22bis V23
Access: Public
Computer: Saffire AT
DOS: MS DOS
BBSoftware: Opus

Ballarat C.A.E.
Sysop: Thoshan Ruberu
Phone: (053) 33-9285
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT
DOS: PC DOS
BBSoftware: Opus

Big Tedd's Bulletin Board
Sysop: Rob Bates
Phone: (03) 509-6067
FIDOnet: 3:634/381
Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: IBM XT Clone
BBSoftware: Opus

Bits & Bytes
Sysop: Linda Brown
Phone: (059) 81-2186
FIDOnet: 3:632/999
Baud: V22 V22bis
Access: Public
Computer: XT Turbo
DOS: PC DOS
BBSoftware: Opus

Brainstorm Oz!
Sysop: Rowan Stevens
Phone: (03) 758-7086
FIDOnet: 3:632/305
Baud: V21 V22 V22bis V23 B103 B212
Computer: IBM XT
DOS: MS DOS
BBSoftware: Opus

Chicago
Sysop: Bruce Wayne
Phone: (03) 728-6698

Baud: V21 V22 V22bis V23
Access: Public
Computer: XT Turbo
BBSoftware: QuickBBS

Club Amiga
Sysop: Robert Canavan
Phone: (03) 743-1957
FIDOnet: 3:633/376
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: RemoteAccess

Comet BBS
Sysop: Mark Dods
Phone: (03) 879-0108
FIDOnet: 3:633/377
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: QBBS

Compusoft BBS
Sysop: George Tsoukas
Phone: (03) 386-6019
Baud: V21 V22 V22bis V23
Access: Mem Reg LVA
Computer: Mitac 386
DOS: MS DOS
BBSoftware: Opus

Custom Programming BBS
Sysop: Alan Williamson
Phone: (03) 848-3331
OZnet: 7:831/340
Baud: V22 V22bis HST
Access: Public
Computer: IBM AT Clone
DOS: PC Dos
BBSoftware: PCBoard

Cybertech
Sysop: Spectral Image
Phone: (059) 85-5574
Baud: V21 V22 V22bis V23
Access: Public
Hours: Weekdays: 2200 - 1800
Computer: XT Clone
BBSoftware: Opus

dBoard
Sysop: John Kewley
Phone: (03) 525-6252
Baud: V21 V22 V23
Access: Mem Reg VA
Computer: IBM AT Clone
DOS: PC DOS
BBSoftware: JBBS

Delta BBS
Sysop: Big Mother
Phone: (03) 793-4548
Baud: V21 V22 V22bis V23
Access: Public
Computer: Apple //e
BBSoftware: TproBBS

Dr Blaze
Sysop: Ron Lyth
Phone: (03) 890-9323
FIDOnet: 3:634/384
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
BBSoftware: Opus

Eastcom Opus CBCS
Sysop: Keith Haslam
Phone: (03) 808-0775
OZnet: 7:830/312
Baud: V21 V22 V22bis
Access: Public
Computer: Eastcom 386/20C
DOS: PC MOS
BBSoftware: Opus

Eastern Plains BBS
Sysop: Martin Taylor
Phone: (051) 76-1125
Baud: V21 V22 V22bis V23 B103 B212
Access: LVA
Hours: Weekdays: 0700 - 2300-Weekends: 24 Hours
Computer: IBM AT Clone
DOS: MS DOS
BBSoftware: Searchlight

Eastern Suburb Eighty User Group
Sysop: Martin Axford
Phone: (03) 819-5179
FIDOnet: 3:632/347
Baud: V21 V22 V22bis V23
Access: Public
Computer: Ultra AT
DOS: DOS
BBSoftware: Opus

Fourth Dimension BBS
Sysop: Galvatron
Phone: (03) 560-9292
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: QuickBBS

Green Griffon Inn
Sysop: The Obsidian
Phone: (03) 460-1128
FIDOnet: 3:633/202
Baud: V21 V22 V22bis V23
Access: Public
Hours: Daily: 2200 - 0630
Computer: IBM XT
DOS: MS DOS
BBSoftware: RemoteAccess

Happy Hacking BB
Sysop: Eric Anderson
Phone: (03) 787-8759
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: QuickBBS

High Voltage
Sysop: Scott Fraser
Phone: (054) 41-6054
FIDOnet: 3:635/504
Baud: V21 V22 V22bis V23
Access: Public
Computer: Profound XT Clone
DOS: MS DOS
BBSoftware: QuickBBS

Hitchhikers Guide to the Galaxy
Sysop: Zaphod Beebelbrox
Phone: (03) 546-3038
Baud: V21 V22 V22bis V23
Access: Public
Hours: Daily: 0700 - 2300
BBSoftware: QuickBBS

Icehouse BBS
Sysop: Barbara Linton
Phone: (03) 720-3261
FIDOnet: 3:636/500
Baud: V22 V22bis B103 B212
Access: Public
Computer: IBM 386 Clone
DOS: MS DOS
BBSoftware: Opus

Island BBS
Sysop: Ross Skinner
Phone: (03) 742-3993
Baud: V21 V22 V22bis V23
Access: Mem VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: QuickBBS

Latrobe Valley BBS
Sysop: Stephen Semple
Phone: (051) 27-4302
FIDOnet: 3:632/351
Baud: V21 V22 V22bis V23 V32
Access: Reg LVA
Computer: IBM AT Clone
DOS: MS DOS
BBSoftware: Lynx

Little Shop of Horrors
Sysop: John Marsden
Phone: (03) 583-4778
FIDOnet: 3:633/364
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT
DOS: MS DOS
BBSoftware: RemoteAccess

MACE
Sysop: Ron Cork
Phone: (03) 764-1185
Baud: V21 V22 V22bis V23
Access: Mem Reg VA
Computer: Atari ST
DOS: Atari TOS
BBSoftware: Michtron

Melbourne Data Exchange
Sysop: Tervor McKersher
Phone: (03) 596-8022
Baud: V22 V22bis V23
Access: Public
Computer: IBM Clone
DOS: MS DOS
BBSoftware: Opus

Melbourne Forth Interest Group
Sysop: Lance Collins
Phone: (03) 809-1787
Baud: V21 V22 V22bis V23
Access: Mem VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: PCBoard

Melbourne PC Users Group BBS
Sysop: Colin Macauley
Phone: (03) 696-2760
OZnet: 7:833/391
Baud: V21 V22 V22bis V23
Access: Mem LVA
Computer: Wyse 386
BBSoftware: Opus

Metamorphosis CBCS
Sysop: Laserblade
Phone: (03) 560-2659
Baud: V22 V22bis
Access: Public
Hours: 2100 - 0800 Daily
BBSoftware: Opus

Micom CBCS
Sysop: Peter Jetson
Phone: (03) 758-8642
FIDOnet: 3:633/371
Baud: V21 V22 V22bis V23
Access: Mem Reg
Computer: IBM Clone
DOS: MS DOS
BBSoftware: Opus

Narnia
Sysop: Lord Aslan
Phone: (059) 83-2046
Baud: V21 V22 V22bis
Access: Public
Hours: Daily: 2300 - 0700Weekdays: 1600 - 1730
Computer: XT Clone
DOS: MS DOS
BBSoftware: QuickBBS

Nitroland
Sysop: Nitro
Phone: (054) 41-6515
Baud: V21 V22 V23
Access: Mem VA
Computer: Commodore PC
DOS: MS DOS
BBSoftware: Wildcat

Niveous
Sysop: Rupert Russell
Phone: (053) 33-2170
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM Clone
DOS: MS DOS
BBSoftware: QuickBBS

Omega BBS/Vortex Host
Sysop: Mark Gregson
Phone: (052) 22-1670
Baud: V21 V22 V22bis V23 B103 B212
Access: Public
Computer: MicroDOS 386
DOS: Xenix
BBSoftware: Xenix BBS

Orion
Sysop: Phoenix
Phone: (03) 568-0835
Baud: V21 V22 V22bis
Access: Public
Computer: IBM AT
DOS: MS DOS
BBSoftware: Searchlight

Outer East BBS
Sysop: Ross Sargent
Phone: (03) 736-1181
FIDOnet: 3:633/373
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: MS Dos
BBSoftware: Opus

PC Connection IBBS
Sysop: Lloyd Borrett
Phone: (03) 388-0909
OZnet: 7:833/392

Baud: V21 V22 V22bis V23
Access: Reg LVA
Computer: Ultra AT
DOS: MS DOS
BBSoftware: The Major BBS

Peninsula Colour Computer Club BBS
Sysop: Stan Blazejewski
Phone: (03) 580-4605
Baud: V21
Access: Reg LVA
Hours: Daily: 2130 - 0700
Computer: Tandy CoCo 1
BBSoftware: Colorama

Personal Computer Support Group
Sysop: David Woodberry & Bob Stafford
Phone: (03) 563-9102
FIDOnet: 3:634/382
Baud: V21 V22 V22bis V23
Access: Mem Reg VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

Rastar
Sysop: Alf
Phone: (03) 369-2403
Baud: V21 V22 V22bis
Access: Public
Computer: IBM AT Clone
BBSoftware: WWIV

Redback BBS
Sysop: Shalamar
Phone: (058) 21-8273
Baud: V21 V22 V22bis V23
Access: Mem Reg LVA
Hours: Weekdays: 2200 - 0600- Weekends: 2100 - 0600
Computer: Amiga 1000
DOS: AmigaDOS
BBSoftware: BBS-PC!

Sam's Opus BBS
Sysop: Alan Haslar
Phone: (03) 563-1117
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: Opus

SMART BBS
Sysop: Richard Hoskin
Phone: (03) 602-1336
FIDOnet: 3:632/302
Baud: V21 V22 V22bis PEP
Access: Public
Computer: ALR 386
DOS: PC DOS
BBSoftware: Opus

Southern Mail
Sysop: Maurie Halkier
Phone: (03) 725-1621
OZnet: 7:830/320
Baud: V22 V22bis PEP
Access: Public
Computer: Eastcom 386/25
DOS: PC MOS
BBSoftware: Opus

Swinestud
Sysop: Craig Silva
Phone: (03) 818-6389
FIDOnet: 3:633/363
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: QuickBBS/Opus

Tardis II
Sysop: Malcolm Miles
Phone: (03) 859-3109
Baud: V21 V22 V22bis V23
Access: Public
Computer: PC
DOS: Concurrent DOS
BBSoftware: CALLME/GOLIATH

The Amiga Limits
Sysop: Magnus Magnanimous
Phone: (03) 725-2895
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: IBM AT
DOS: PC DOS
BBSoftware: QuickBBS

The Black Board
Sysop: Negative Energy
Phone: (03) 776-5206
Baud: V21 V22 V22bis V23
Access: Public
Computer: Apple IIe
BBSoftware: GBBS Pro
Note: Type NEW at the 'Login:' prompt

The Boolean Board
Sysop: Ian Marr
Phone: (055) 62-9797
FIDOnet: 3:635/414
Baud: V21 V22 V22bis
Access: Public
Hours: Mon - Sat: 1800 - 0900Sat - Mon: 1200 - 0900
Computer: Acer Plus 700
DOS: MS DOS
BBSoftware: Opus

The Cage
Sysop: Avatar
Phone: (03) 813-2614
Baud: V21 V22 V22bis V23
Access: Mem Reg LVA
Computer: IBM 386 Clone
DOS: PC DOS
BBSoftware: WWIV

The CatHouse DownUnder
Sysop: John Princen
Phone: (03) 875-8215
Baud: V22 V22bis
Access: Public
Computer: Ultra AT
DOS: PC DOS
BBSoftware: Wildcat

The Cheltenham Exchange
Sysop: Garry Gillard
Phone: (03) 585-0495
FIDOnet: 3:636/401
Baud: V22 V22bis B103 B212
Access: Public
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

The Crossover
Sysop: Stephen Paddon
Phone: (03) 364-1282
Baud: V21 V22 V22bis V23
Computer: IBM AT
BBSoftware: QuickBBS

The Further Regions QuickBBS
Sysop: The Outsider
Phone: (03) 725-1923
Baud: V21 V22 V22bis V23 B103 B212
Access: Public
Computer: IBM AT
DOS: PC DOS
BBSoftware: QuickBBS

The Great MacHouse
Sysop: Matthew Simpson
Phone: (03) 561-6942
Baud: V21 V22 V22bis V23
Access: Public
Computer: Macintosh
DOS: HFS
BBSoftware: Red Ryder Host

The Hot-Line
Sysop: Mark Firus & Darren King
Phone: (03) 547-5117
Baud: V22 V22bis B103 B212
Access: Reg LVA
Computer: IBM XT Clone
DOS: MS DOS
BBSoftware: Opus

The Image BBS
Sysop: Garry Stuart & Nigel Newby
Phone: (03) 720-1259
OZnet: 7:833/397
Baud: V21 V22 V22bis V23
Access: Public
Computer: Image 386
DOS: PC DOS
BBSoftware: Opus

The Last Crusade
Sysop: Dion Wallace
Phone: (03) 720-6816
FIDOnet: 3:636/310
Baud: V21 V22 V22bis
Access: Public
Computer: Micronica 386
BBSoftware: Opus

The Last Frontier
Sysop: Alternate One
Phone: (03) 885-9110
Baud: V22 V22bis
Access: Public
BBSoftware: QuickBBS

The Mad House
Sysop: TML
Phone: (03) 758-9573
Baud: V21 V22 V22bis
Access: Public
BBSoftware: RemoteAccess

The Outer Limits
Sysop: Captain Kirk
Phone: (03) 725-6650
Baud: V21 V22 V22bis V23
Access: Reg VA
Computer: IBM AT
DOS: PC DOS
BBSoftware: Opus

The Pirate's Cove
Sysop: Scott Enwright & The Marauder
Phone: (03) 596-1589
Baud: V21 V22 V22bis V23
Access: Public
Computer: NEC Powermate 386
DOS: MS DOS
BBSoftware: Lynx
Note: Second line: (03) 596-2656

The Real Connection
Sysop: The Real Article & Deep Image
Phone: (03) 808-0810
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM XT Clone
DOS: DoubleDOS
BBSoftware: Opus
Note: Second Line: (03) 808-0331

The Roaring Rapids
Sysop: Greg Holloway
Phone: (03) 877-2609
FIDOnet: 3:633/203
Baud: V21 V22 V22bis V23
Access: Public
Computer: Epson PCe
DOS: MS DOS
BBSoftware: RemoteAccess

The Round Table
Sysop: King Arthur
Phone: (03) 807-1632
Baud: V21 V22 V22bis
Access: Public
BBSoftware: QuickBBS
Note: 300 baud (V21) available 0000 - 1200daily ONLY!

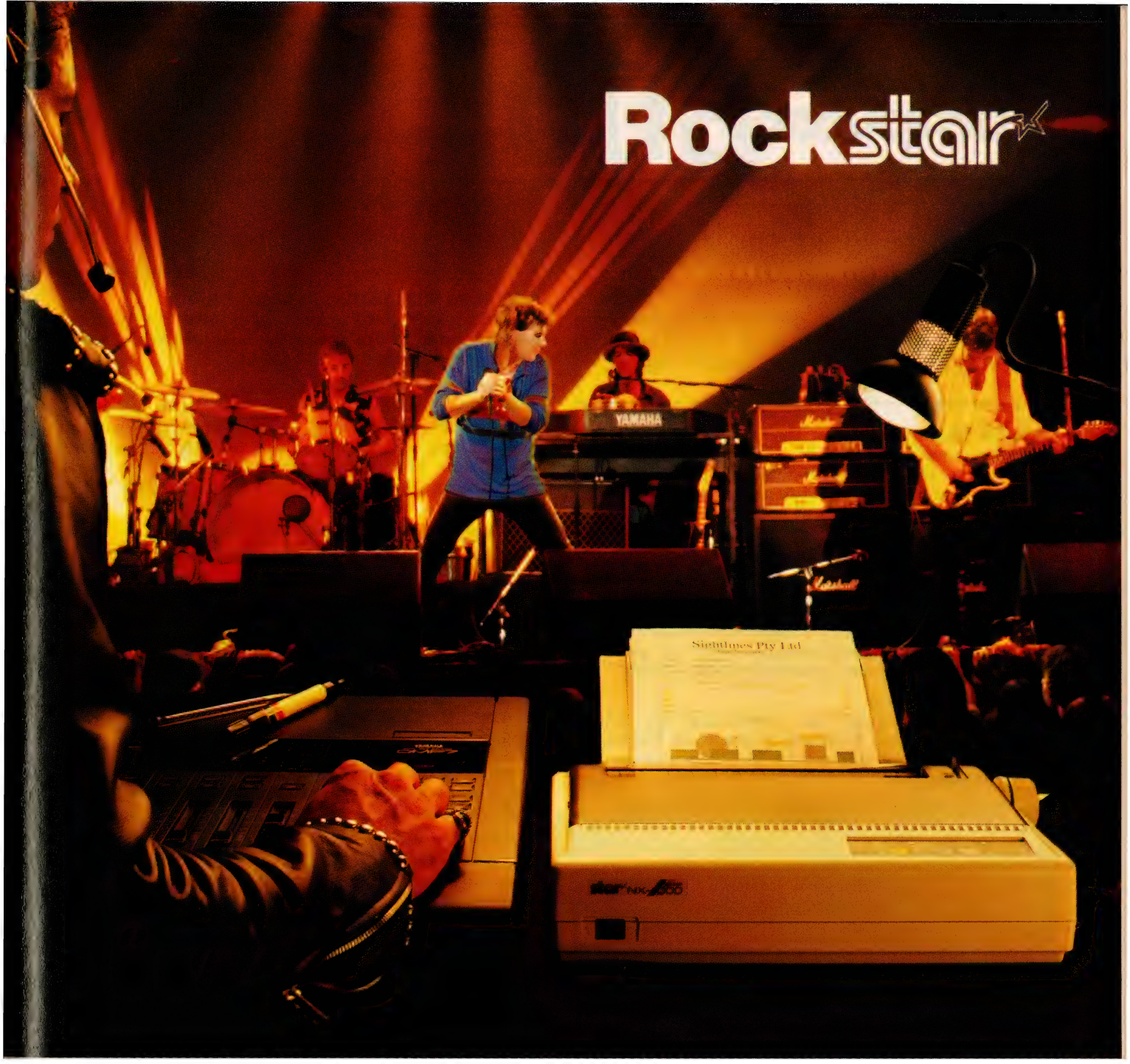
The Seven Seas
Sysop: Warfish
Phone: (03) 49-1367
Baud: V21 V22 V22bis V23
Access: Public
BBSoftware: QuickBBS

The Software Bank
Sysop: Simon Walsh
Phone: (03) 816-9439
FIDOnet: 3:632/301
Baud: V22 V22bis B103 B212 PEP
Access: Reg LVA
Computer: IBM XT Clone
DOS: PC DOS
BBSoftware: Opus

The Ultimate Illusion
Sysop: Simon Gronow
Phone: (03) 589-4713
FIDOnet: 3:632/998
Baud: V21 V22 V22bis V23
Access: Public
Computer: XT Turbo
DOS: PC DOS
BBSoftware: Opus

The Underground
Phone: (03) 840-1565
Baud: V21 V22 V22bis V23
Access: Public
Computer: IBM AT Clone
Note: 4 Lines available on the above number

The Wastelands
Sysop: Colin Berg
Phone: (03) 309-6645
FIDOnet: 3:635/501



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All you basically need to know, presented in a short and practical form, to use one of the most popular of word-processing packages. BP-262 $13.00

Practical Computer Experiments
This book aims to fill in the background to the microprocessor by constructing typical computer circuits in discreet logic and it is hoped that this will form a useful introduction to devices such as adders, stores etc as well as a general source book of logic circuits. BP-78 $6.00

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Starts by designing a small computer and because of its simplicity and logical structure, the language is easy to learn and understand. BP-72 $6.00

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This book shows you how to make the most of the Atari ST musically, with simple add-on circuits and program routines. BPI-246 $18.00

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An Introduction to Computer Peripherals
Covers such items as monitors, printers, disc drives, cassette recorders, modems, etc explaining what they are, how to use them and the various types and standards. BP-170 $6.50

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RATING WITH PCs

Who says PCs will never replace mainframes – not Peter Nolan (or A.C. Nielsen).

In the mid eighties it was mooted that given the current rapid state of development of the Intel processor chip used in PCs, these desktop machines would soon pose a threat to mainframes. This view wasn't all that widely believed because even ubiquitous PCs in a whole large LAN configuration could hardly contain the enormous volume of raw data often required for on-line processing.

Threatening mainframes, however, was not too far off even though it might have been considered a radical concept. The late 1980s would show that in some cases mainframes were dumped in favour of a networked PC installation. For example, take A.C. Neilsen, of North Ryde, Sydney.

You have no doubt heard of the Neilsen Ratings? A term that pours fear into the hearts of radio and TV program directors throughout the world. A lesser known aspect of Neilsen's operations is product and sales tracking for a variety of retail chains and industries. This activity requires a huge database of information which must be updated almost daily.

The information, once on the machine, must be retrievable in an unimaginable range of cross relationships to produce reports for clients. Major strategic marketing decisions can often rest entirely on the information produced in these reports, therefore they must be up-to-date and very accurate. Obviously, the accuracy aspect is taken care of by the system programmers and the methods they use to cross relate the sales data gathered. The up-to-date side of things means an awful

lot of keying raw data into the system each day.

Neilsen's computer installation consisted of a mainframe IBM 4381 for data storage and processing power, and a Nixdorf mainframe for data entry. The common link between these two dissimilar systems was a half-inch tape drive system. The raw data was keypunched by a team of more than 20 operators to the Nixdorf which would dump the data to tape as each batch was processed. An operator would then take the tape from the Nixdorf to the IBM and upload it. At the time of the original installation, this made for a very cost effective solution.

In the face of a fair amount of derision and disbelief, a directive was given by Peter Turner, the company's systems manager, to replace the Nixdorf with networked PCs.

A problem that had not been foreseen with this system was the operating efficiency of the Nixdorf under load. Operators tried to throw data at 17,000 keystrokes per hour (kph) at it while it tried to cope with dumping to tape at regular intervals. At times the Nixdorf would force the keystroke rate to as low as 2,000kph as it struggled to share its favours with 20 operators and a very insistent tape drive.

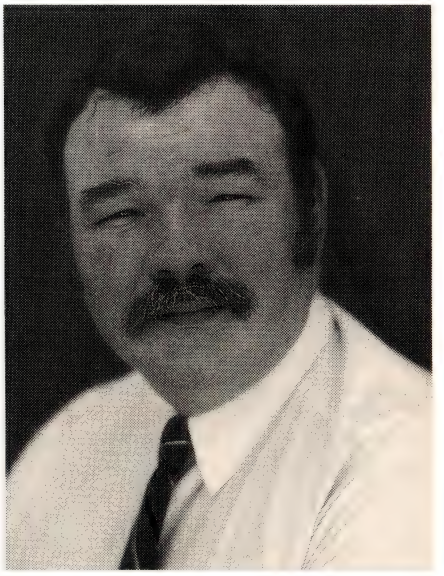
With 20 operators keying at 2,000kph it was hardly an economically satisfactory situation. The number of operators over the years had steadily increased along with the volume of data to be punched. The Nixdorf was obviously not coping well under this load. There was no doubt within the company that something had to be done.

A decision was made which fairly shook the foundations of Neilsen. In the face of a fair amount of derision and disbelief, a directive was given by Peter Turner, the company's systems manager, to replace the Nixdorf with networked PCs. The scoffing from the mainframe diehards echoed throughout the normally hushed walls of the Neilsen big-iron dungeons.

In true Aussie fashion, the general consensus of opinion was to sit back and watch Turner stuff this one up – networked PCs, indeed! Undaunted, Turner appointed Alan Vince to the project to liaise with Graham McPherson, the company's PC support officer in proposing a PC solution. The rest is, of course, history: the system is in, it works and productivity is up by a staggering factor of three with a substantial reduction in keypunch operators.

The heart of the system is a Compaq Deskpro 386/20 PC running Novell Netware 2.1. Data is stored on two Compaq 300Mb hard disks operating in parallel. PS/2 model 30 workstations with 20Mb hard disks are connected to the server via a Token ring system. Data entry is keyed using Data Point 90 with batches being uploaded directly to the mainframe IBM via an AttachMate Extra card.

The Compaq DeskPro as a file server was an obvious choice because of speed, large hard disk capacity, and the standard ISA bus for the networking and peripheral cards. Again, Compaq was the only serious option for server storage as IBM were unable to supply high capacity hard disks at the time. The two 300Mb hard disks are operated in parallel using Novell's SFT level 2 software.



*We had planned to use an IBM 3270 card as a direct link for uploading data to the mainframe, but continuing problems forced the team to look for an alternative. We installed an AttachMate card which has performed faultlessly ever since – the problems we encountered with the card appeared to be with the accompanying software, which was often in conflict with the Novell system. The Extra! software with the AttachMate card suffered none of these problems – **Peter Turner, A.C. Nielsen's systems manager.***

Redundancy to burn

WITH DUAL disk controller cards utilizing the full mirroring features of the SFT software, this installation has built-in redundancy to burn.

An interesting feature of the system is that under normal keying load, the data is dumped to both disks simultaneously. As the keying load increases to a saturation point, the data is dumped to each drive alternately. When a lull is detected the software then cross-updates both disks with the missed batches. This brings the system back up to parallel storage.

As a rudimentary type of test, the Enter key was taped down on eight workstations while running the Data entry software. This represented a rate of about 28,000kph per machine under which the server system performed flawlessly.

As added protection to the stored data the server is backed up by an uninterruptible power supply (UPS). This was not so much an act of paranoia but more a realistic approach to the power conditions existing in the North Ryde area of Sydney. This area experiences brownouts almost daily and blackouts almost weekly. Even though these are of fairly short duration, the added security afforded by the UPS more than justified the cost of $2,000.

PS/2s were chosen as workstations largely as a result of the company's PC unification directives. It stipulated PS/2s for workstations and low-end desktop use, Compaqs for high-speed, large volume data storage, Toshiba and Compaq for portables. This enabled the PC-support people to become very proficient in handling a small range of brands and models.

As a workstation, the model 30 with a 20Mb hard disk could be used as a standalone data entry point in the event of a network failure. Operators could load the data entry software via diskette to the workstation and continue keying until the network was up and running again.

As a result of previous and continuing problems with IBM's model 8513 monitor, it was decided to use Compaq VGA monitors on all of the workstations. The original company directive was modified to specify the Compaq monitors in prefer-

ence to the IBM ones which came about as a result of the 70 to 80 per cent fault rate experienced with IBM's offering.

The network

AFTER A lot of reading and evaluation of test results the network configuration was decided. Novell 2.1 was chosen due to its large, and well-tried user base and generally bug free operation. Token ring was employed over Ethernet because of its improved performance as load or data traffic increased. At a base level, Ethernet has the edge, but as load increases it is generally acknowledged that Token ring wins in efficiency.

Since the team was treading almost virgin ground, data entry software had to be sought out and tested. The finalist was Data Point 90, a product from Datalex in the US. Currently this product is distributed by Commercial Computer Centre (CCC) in the Sydney suburb of Parramatta, (02) 635 6533.

According to Turner, Data Point 90 was easy to use and very flexible in configuring it to suit this application. 'It also included a very logically structured programming language for changing or modifying the way it worked. This made the choice of Data Point 90 fairly obvious when compared with the other players in this field', Turner said.

'CCC were extremely helpful in setting up and installing the software by providing good customer support and backup for the product', he further commented. A written agreement was sought and attained through CCC for the occasional multiple use of the software under breakdown conditions. This prevented an infringement of any of copyright laws while saving the added expense of purchasing site licences for 12 extra copies that may never be used.

As mentioned above, should the server or network suffer a fault, the operators simply load Data Point 90 from diskette onto their local hard disk and continue as normal. When the system was back up and running the keyed batches would be automatically uploaded to the server. The workstation could then re-log to the network and continue with the minimum of interruption.

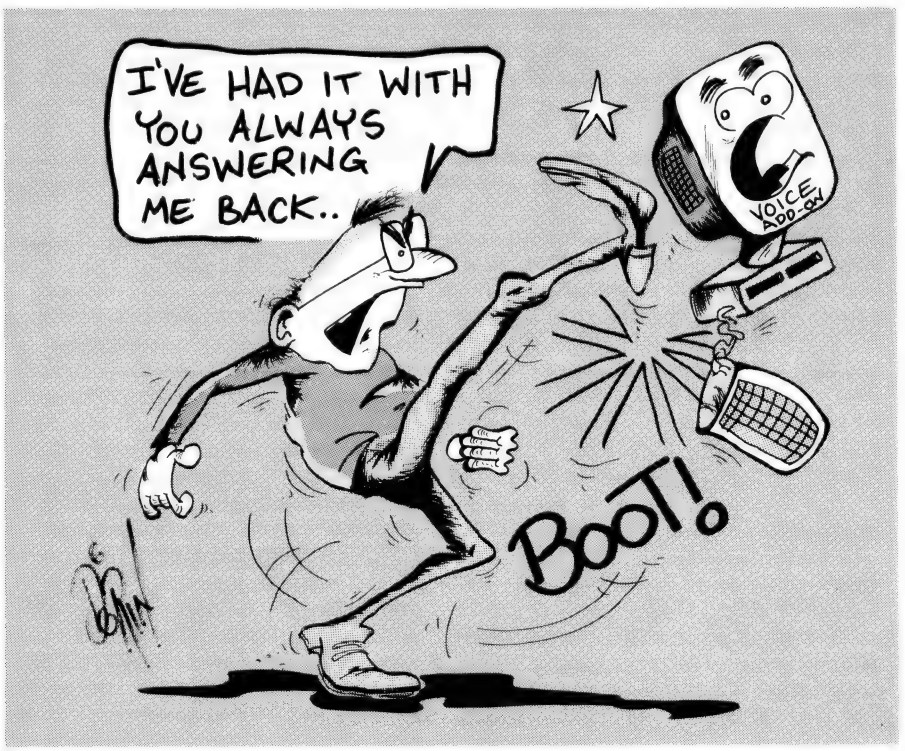
'It was planned to use a 3270 card as a direct link for uploading data to the mainframe but continuing problems forced the team to look for an alternative. We installed an AttachMate card which has performed faultlessly ever since,' Turner said. 'The problems we encountered with the 3270 card appeared to be with the accompanying software which was often in conflict with the Novell system. The Extra! software with the AttachMate card suffered none of these problems.'

During the course of each day's punching sessions, the stored data is uploaded from the Compaq hard disks to the IBM mainframe. The time this process takes depends on the volume of data that has been punched, but it is transferred up to the IBM at about 2Mb a minute. This process is completely transparent to the operation of the network, as is the backup of data to tapes.

Where the Nixdorf once struggled along, the PCs can fly through their tasks without a keypunch operator ever being aware it is happening.

The process of investigating a suitable system configuration, purchasing, installing and testing took a period of seven months. 'There were very few bugs to iron out,' McPherson commented, 'as we had, in the main, opted for well established products with a history of reliable operation. Probably our biggest problem came from the operators changing from the Nixdorf dumb terminal keyboard layout to the IBM's. It is to the operators great credit that they were all back up to speed in less than a month.'

At a base level, Ethernet has the edge, but as load increases it is generally acknowledged that Token ring wins in efficiency.



The overall cost for the Compaq DeskPro, two 300Mb hard disk systems, a dual 150Mb tape backup, 12 PS/2 model 30s with 20Mb disks, assorted cards, cabling and software was less than $150,000 – less than had been budgeted!

Where once there stood a proud and mighty Nixdorf there is now a humans desk with a PC on it. Not only does the networked PC system work better, it takes up much less space. The server sits on a small table in Alan Vince's office while the Nixdorf's old dust-free, air conditioned space has been given over to the PC support department as an interim office. (If I were an IBM mainframe I might be a little worried as I looked through the adjoining window.)

The required number of keypunch operators has dropped from over 20 to a rarely used maximum of 12. Data throughput has increased by nearly 3 times, and down time is almost non existent. □

ASSEMBLING QUICKBASIC

Part 11

This month, Jeff Richards shows how the same code can have two functions, and MATDIM, which returns the number of dimensions of an array.

ONCE USER-WRITTEN assembly language procedures are coded, tested and compiled into a library, they become as much a part of the language as the intrinsic functions and procedures. However, there are some respects in which user-written routines cannot match the features of built-in procedures. Some of these restrictions can be overcome, but some just have to be accepted.

Most of the problems arise from the fact that the compiler cannot 'know' anything about the user-written routines. This means, for instance, that it is impossible for the compiler to make the sort of optimisations that it uses frequently for its built-in operators and procedures.

Another limitation comes about because user-written routines should be declared before they are used. This ensures that parameter-type checking will be carried out and also makes the use of the procedures a little simpler. But, if parameter type checking is enabled, then it is not possible to construct routines that can cope with a variable number of arguments, or variable argument types. Many QuickBasic intrinsic functions accept a number of arguments, and some permit certain parameters to be defaulted. It is difficult for user-written routines to match this flexibility.

An example of a QuickBasic function that can accept more than one parameter type is the HEX$ function – the parameter passed to this function can be either a short integer or a long one. The

```
TITLE MATH    QuickBASIC 4 Library Routine
DOSSEG
.MODEL MEDIUM
.CODE

PUBLIC IsEven, IsEvenL
;************************************************
;* FUNCTION ISEVEN%(N%)                         *
;* RETURN TRUE IF N% IS EVEN, ELSE RETURN FALSE *
;                                               *
;* FUNCTION ISEVENL%(N&)                        *
;* RETURN TRUE IF N& IS EVEN, ELSE RETURN FALSE *
;************************************************
```

```
Math PROC                       ;PROCEDURE STARTS HERE.
IsEven:                           ;THE TWO ENTRY POINTS ARE
IsEvenL:                          ; THE SAME.

     Push   BP                  ;SAVE BP REGISTER.
     Mov    BP,sp               ;MAKE BP INTO FRAME POINTER.
     Mov    BX,[bp+6]           ;USE FRAME POINTER TO ACCESS
     Mov    AX,[BX]             ; THE PARAMETER.
     And    AX,1                ;CLEAR ALL BUT LOWEST BIT.
     Dec    AX                  ;ADJUST FOR 0, -1
     Pop    BP
     Ret    2                   ;RETURN PAST ONE ARGUMENT.
Math ENDP                       ;PROCEDURE ENDS HERE.
```

Listing 1. *ISEVEN and ISEVENL are both the same code but defined as two functions. Although the two functions have different names and are declared in different statements, the actual code that is executed is the same for each. The overhead involved in the additional function name is simply the additional name-table entry for programs running in the environment. There is no additional overhead for programs compiled to run standalone.*

compiler is aware that the code that implements the HEX$ function can only handle a long parameter, so if the user supplies a short integer, then the compiler will insert a few instructions that convert the short integer to a long one before calling the HEX$ procedure.

User-written assembly language routines that can deal with arguments of different types must attack the problem differently. Often, this will involve writing a separate procedure for each argument type, even though they may share a certain amount of common code. However, some routines are actually identical regardless of the argument type. In these cases, it may be preferable to disable parameter type checking and call the same routine with whatever varieties of arguments are appropriate.

An example of a routine that can use the same code for different variable types is the ISEVEN function – a function to return *true* if the argument is evenly divisible by two, or *false* otherwise. This routine only examines the lowest order bit of the lowest order word of its argument. A short integer argument would consist of one word, while a long integer argument would have two. But the high-order word of the long integer is of no interest to the routine, and short and long integers are handled equally well by the same code.

Of course, floating point numbers are a different story, and the routine will return meaningless results for short or long real numbers. (If a string is passed to the routine, the result is not only meaningful, but, in a perverse sort of way, consistent with the Integer results! Careful study of the code will reveal just what the ISEVEN function returns for string arguments, but an empirical analysis is more interesting.)

Probably the easiest way to take advantage of the dual nature of the function is to define the same code as two functions – ISEVEN and ISEVENL in this case. Although the two functions have different names and are declared in different statements, the actual code that is executed is the same for each. The overhead involved in the additional function name is simply the additional name-table entry for programs running in the environment. There is no additional overhead for programs compiled to run standalone.

Many QuickBasic intrinsic functions accept a number of arguments.

Note that this use of common code is only possible because QuickBasic always passes the address of the argument to the routine – never the actual value. If QuickBasic was passing a value, the routine would have to account for the fact that long integers are two words while short integers are only one. Because an address is always one word long, the routine can use the same code for both types of arguments.

An example of the alternative approach – of disabling parameter-type checking and calling the routine with any argument type – involves an odd oversight in QuickBasic concerning arrays.

Consider for a moment the problems involved in writing general purpose array handling procedures, for example, a matrix multiply routine or matrix I/O. The information that such a routine needs (assuming the array type – integer, real, and so on – is known) is the number of dimensions and the lower and upper bound of the elements of each dimension. The LBOUND and UBOUND intrinsic functions provide the size of each dimension, but there is no convenient way of finding the number of dimensions.

If the structure of the array descriptor is known, then it is relatively easy to write an assembly language routine that returns the number of dimensions. Such a routine will be indifferent to the array type, and the same routine will return valid information for integer, real and string arrays. In this case, the easiest way to use such a routine would be to disable parameter type checking and to use the same function name for getting the dimensions of any type of array.

```
TITLE MATRIX  QuickBASIC 4 Library Routine
DOSSEG
.MODEL MEDIUM
.CODE
PUBLIC MatDim

;************************************************
;*    DECLARE FUNCTION MATDIM% (I())            *
;*    Return the number of dimensions in        *
;*    Matrix I().   Note: This routine works    *
;*    for any array type (including string).    *
;************************************************

MatDim      PROC
      Push    bp          ;SAVE BP
      Mov     bp,sp       ;MAKE BP A FRAME POINTER
      Mov     bx,[bp+6]   ;GET THE ARRAY DESCRIPTOR
      Mov     ax,[bx+8]   ;GET THE WORD AT OFFSET 8
      Mov     ah,0        ;CLEAR THE HIGH-ORDER PART
      Pop     bp          ;RETRIEVE BP
      Ret     2           ;AND HOME.

MatDim      ENDP
END
```

Listing 2. *The MATDIM function will return the number of dimensions of an array. The array can be any type – numeric, string or user-defined.*

Array dimensions

LISTING 2 is the MATDIM function. It will return the number of dimensions of an array. The array can be any type – numeric, string or user-defined.

Of course, if any one program only uses the routine for one type of array, then parameter-type checking could be implemented for that program. The next time the routine is used in a different program, then it might be declared and used for quite a different array type.

When the same code can be used for procedures involving a variety of data types, then the use of multiple entry points or the disabling of parameter-type checking can be used to give assembly language routines some of the flexibility available in the intrinsic QuickBasic functions. □

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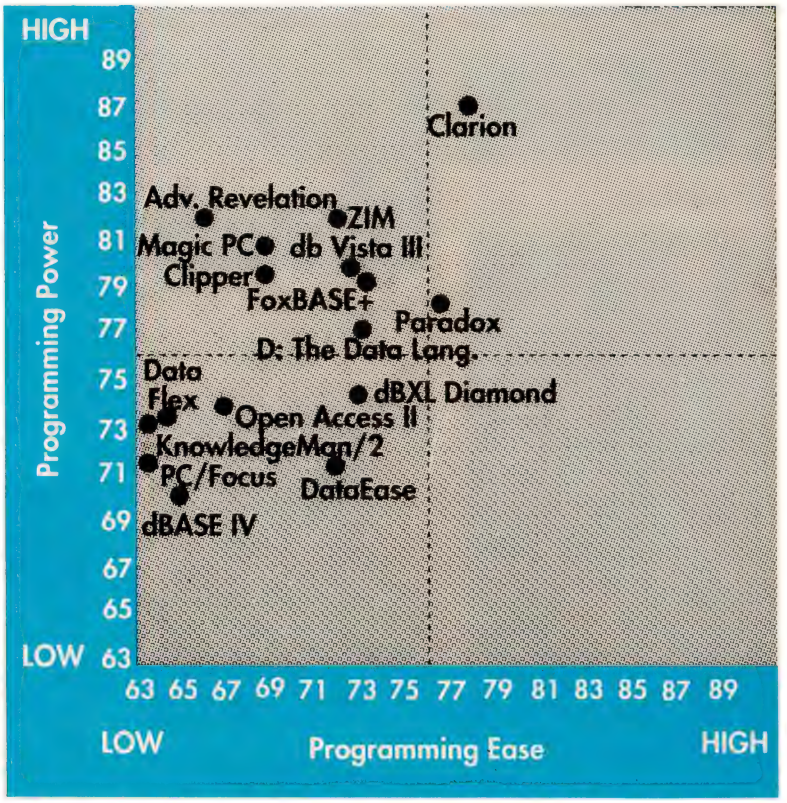

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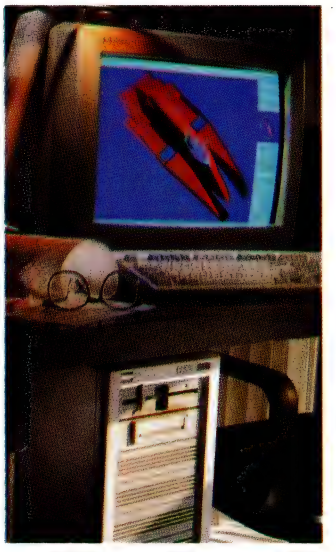

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Warranty: N/S
Price (rrp): N/S

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Parallel ports: 1
Half-height devices: 3 supported
Expansion slots: 1 short, 4 long (4 free)
Display: 14-inch VGA
Keyboard: 101 keys
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Half-height devices: 1 internal; 2 external access supported
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Keyboard: 101 keys
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Expansion slots: 3 short (3 free)
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Keyboard: 101 keys
Other: Optional external 5.25-inch floppy
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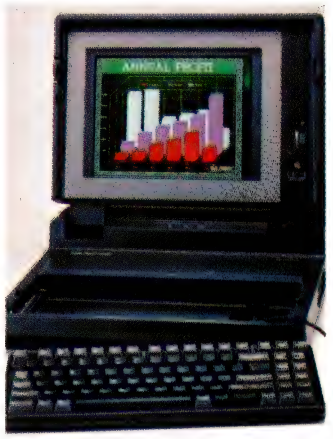
Other: Optional external 5.25-inch floppy
Warranty: 12 months
Price (rrp): $3550; Dual floppy, no hard disk $2550

Portables & Laptops

Hitachi Update



Hitachi Australia
Ph: (02) 929 8799;
Fax: (02) 929 8883
HL500C 16MHz 80386SX
Std. RAM: 1Mb
Max. onboard RAM: 5Mb
Operating system: Dos 3.3
Hard drive: 40Mb
Floppy drive: 1 x 3.5 inch, 1.44Mb
Serial ports: 1
Parallel ports: 1
Other I/O: External monitor
Expansion slots: 1 short, 1 long (2 free)
Display: 10-inch color VGA
Keyboard: Removable, 86 keys
Power: Mains
Price (rrp): about $15,000

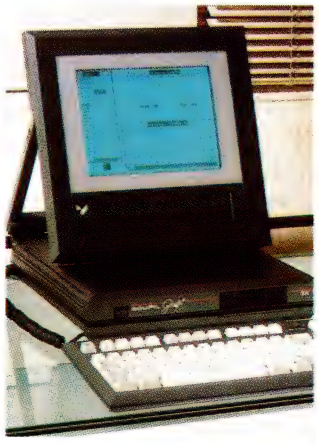
Goupil Update

Quartz Australia
Ph: (03) 663 6509;
Fax: (03) 662 3871
G50 25MHz 80386 tower
Std. RAM: 1Mb
Max. RAM: 9Mb
Operating system: Dos 4.01
Hard drive: 28ms 100Mb (up to 1.2Gb internal)
Disk cache: 32K
Floppy drive: 1 x 3.5-inch 1.44Mb
Serial ports: 2
Parallel ports: 1
Other I/O: Optional 4 or 8 port serial
Expansion slots: 2 short, 6 long
Display: 14-inch VGA
Keyboard: 102 keys
Other: 128K shadow RAM for BIOS
Warranty: N/S
Price (rrp): $13,575; $30,724 with 8Mb RAM, 150Mb tape back-up and 300Mb drive

Renard Update

Veridata Australia
Ph: (03) 417 7055;
Fax: (03) 416 2016
L300 20MHz 80386
Std. RAM: 2Mb
Max. onboard RAM: 8Mb
Operating system: Dos
Hard drive: 40Mb
Floppy drive: 1 x 3.5-inch 1.44Mb
Serial ports: 1
Parallel ports: 1
Other I/O: Optional external drive; expansion chassis; 40Mb external tape drive; internal 2400bps modem
Display: Page-white VGA
Keyboard: 86 keys; port for external keyboard
Weight: 6.4kg
Power: Battery, rated 1.5 to 3 hours
Warranty: N/S
Price (rrp): $7490; $8290 with 120Mb hard disk

Goupil Update



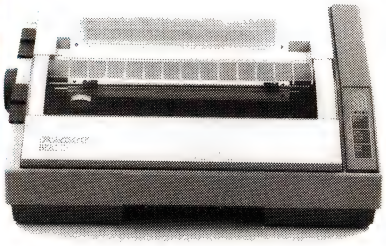
Quartz Australia
Ph: (03) 663 6509;
Fax: (03) 662 3871
Golf 16MHz 80386SX
Std. RAM: 1Mb
Max. RAM: 9Mb
Operating system: Dos 4.01
Hard drive: 40Mb (100Mb also available)
Disk cache: 32K
Floppy drive: 1 x 5.25-inch 360K
Serial ports: 1
Parallel ports: 1
Expansion slots: 2 short
Display: VGA
Keyboard: 102 keys
Other: 128K shadow RAM for BIOS; password security
Weight: 7.2kg
Power: Mains only
Warranty: N/S
Price (rrp): $9115; $10,754 with 100Mb drive. Note: a desktop version with 14-inch VGA screen is also available: $8033 with 40Mb drive, $9672 with 100Mb drive

New releases?

WE ARE ALWAYS seeking new and interesting products to tell our readers about – we are particularly interested in releases that would be useful to small businesses, professional offices and 'standalone' users. Please address release information to: ***Product Updates, Your Computer, PO Box 227, Waterloo 2017 NSW.*** Preference will be given to those accompanied by suitable illustrations. For inclusion in a specific month, material must be submitted 6 weeks prior to the cover date. We are also interested in the stories behind new Australian product development – if there is a tale to your product that you would like to tell our readers, please contact Mark Cheeseman, Features Editor, on (02) 693 4143.

Dot matrix printers

Facit Update



Elmeasco Instruments
Ph: (02) 736 2888;
Fax: (02) 736 3005
9-pin B1200
Rated speed (10cpi): 130cps Draft; 24cps NLQ
Rated noise (working): 58dBa
Carriage width: 9-inch
Dots/character: 9 x 12
Pitch: 10, 12, 17, 20cpi
Resident typefaces: Draft, NLQ
Graphics resolution: 120 x 144
Data buffer: 2K
Color: No
Weight: 5kg
Other: Built-in handle
Warranty: 12 months
Price (rrp): $476

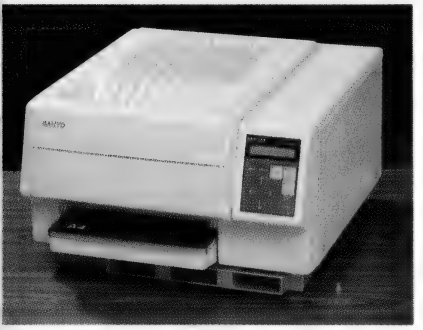
Laser printers

Kyocera Update

Kyocera Australia
Ph: (02) 417 8977;
Fax: (02) 417 7504

10ppm P-2000
Rated noise (working): 55dBa
Paper size: A4, A5
Input/output trays: 250 (1000 optional) input
Engine: Kyocera
Resolution: 300 *x* 300dpi
Resident typefaces: 35
PostScript: Kyocera emulation
Other emulations: LaserJet II, Diablo 630
Data buffer: 5Mb
Buffer expandable to: 6Mb
Other: AppleTalk interface
Warranty: 12-month on-site
Price (rrp): $10,800

Sanyo Update



Sanyo Office
Ph: (02) 929 4644;
Fax: (02) 925 0248

8ppm SPX-608
Rated noise (working): 53dBa
Paper size: A4
Input/output trays: 250-sheet input
Engine: Sanyo
Resolution: 300 *x* 300dpi
Resident typefaces: 9; 120 soft fonts
PostScript: No
Other emulations: LaserJet, Diablo 630, Epson FX-80
Data buffer: 1Mb
Buffer expandable to: 5Mb
Warranty: 3 months
Price (rrp): $4200

TI Update

Texas Instruments
Ph: (02) 887 1122

6ppm TI microLaser
Rated noise (working): under 50dBa
Paper size: A4, B5, envelopes
Input/output trays: 250-sheet input; second tray and envelope tray optional
Resolution: 300 *x* 300dpi
Resident typefaces: 8 plus cartridges
PostScript: Optional
Other emulations: LaserJet II, others optional
Data buffer: 0.5Mb
Buffer expandable to: 4.5Mb
Other: Parallel standard; serial and AppleTalk interfaces optional
Warranty: N/S
Price (rrp): 2790; Model PS35, with PostScript and 1.5Mb RAM 'under $5000'

HP Update
Ph: (03) 895 2895;
Fax: (03) 898 7831

8ppm LaserJet III
Rated noise (working): 55dBa
Paper size: A4; other sizes optional
Input/output trays: 200/200 sheets
Engine: HP
Resolution: 300 *x* 300dpi (has Resolution Enhancement for smoothin)
Resident typefaces: 8 scalable; 14 bit mapped
PostScript: Optional ($1250)
Other emulations: Epson FX and ProPrinter via optional cartridges
Data buffer: 1Mb
Buffer expandable to: 4Mb
Other: AppleTalk interface optional; HP PCL5 printer language (allows multiple orientations on one page and overlays can be opaque or transparent)
Warranty: 12 months on-stie
Price (rrp): 4142

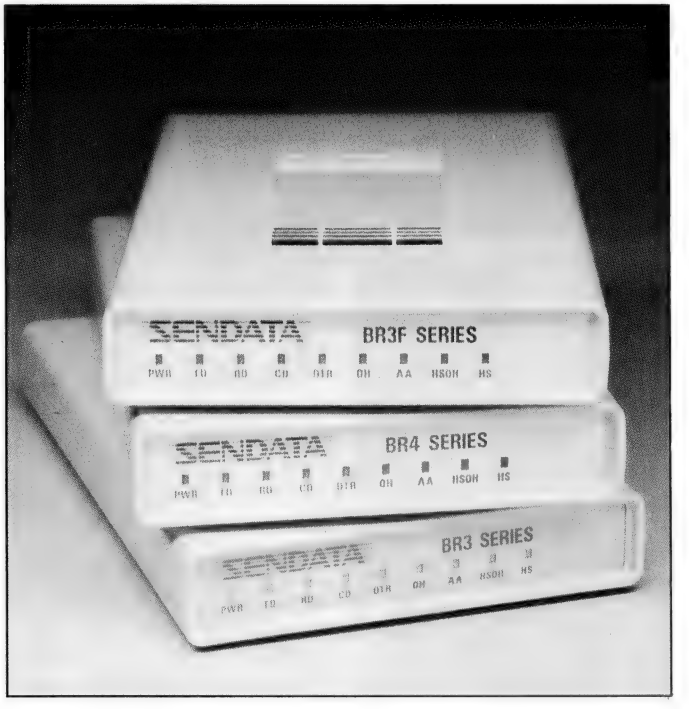
Hardware Updates

Sendata Fax/Modem
Brathstray Pty Ltd
Ph: (03) 561 8011
Fax: (02) 562 1558
Price: $720

Sendata's new BR 3F modem incorporates a 4800bps Group III facsimile – the modem itself supports 2400, 1200 and 300bps full duplex, has auto dial and auto answer, works with tone or pulse dallying and has auto baud detect. The BR 3F is available as either a standalone unit or a half-slot card.

Telecommunications workstation
Sagem Australasia
Ph: (02) 516 5399
Fax: (02) 516 5595
Price: $10,977

Sagem has released a multitasking telecommunications workstation, the TCX3000, comprising a 200dpi scanning fax; a 6ppm, 300dpi laser printer with memory for 160 pages; a CPU, 102-key keyboard and 35cm (diagonal) VGA screen. The CPU is based on Motorola's 68000 chip and a DMA coprocessor; it has built in telex, email and fax functions and is coupled to a 20Mb hard disk and an optional Dos-compatible 3.5-inch floppy drive. The wordprocessor features windows, pull-down menus, a glossary and a tables facility, as well as the

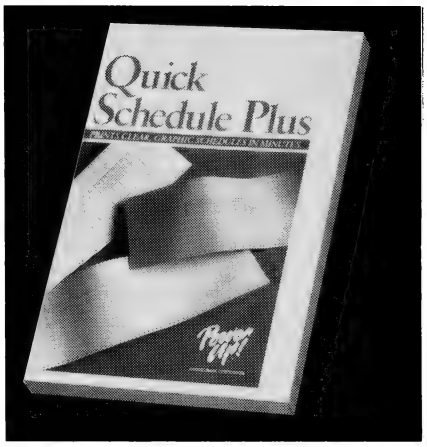


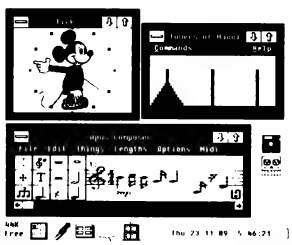
ability to set up templates. It includes a macro facility and 16 different fonts with variable spacing. The 12-second per page scanner can also be used as a photocopier.

Software Updates

Power Up Software
Mindscape International
Ph: (02) 899 2277
Fax: (02) 899 2348
Price: $125.95 Quick Schedule
$95.95 Labels Unlimited
$95.95 Calendar Creator

Mindscape has announced three new software packages from Power Up for the PC. Quick Schedule Plus produces Gantt charts for project management. The package allows for six time scales – minutes, hours, days, weeks, months and years – and a flexible work week. 'Anchor' and starting dates can be adjusted and an entire schedule (or portions of it) can be moved to a new time frame. Each schedule can have up to 500 tasks, spread over 400 time units, up to 10





Windows Software
Public Domain and Shareware

Collection #1 $45 - 20 Windows programs for Microsoft Windows (2.01, 286 or 386) including: **Command Post** adds facilities to the MS-DOS executive window incl. user defined menus, prompting, windows arrange, hot key, screen blanking **Browser** view files in ascii, ansi, hex, fast searching, hide or reveal matching lines **Freemem** Icon dynamically displays free memory *(essential!)* **Firework** Windows version of Macintosh screen blanker **Blowup** capture any part of screen into clipboard *(used to create picture for this ad)* **Easel** View and convert pictures from Paint, Pbrush, Macintosh & GIF formats ***plus*** Mandelbrots, full featured drawing and layout program, disk examiner, 3D o's and x's, Digiclock, Tiler, Calpopup, Phone rolodex, Spy, Ghosts, Crumble, Printer & paginator and *more...*

Collection #2 ***NEW!*** $65 - 40 Windows programs for Microsoft Windows including a cassette cover designer, accounting program, programmers calculator, xtree-like utilities, music composer and tapedeck, Towers of Hanoi, Life, Macintosh Finder simulator, PC-Magazine windows benchmark program, desktop publishing utilities plus Windows games and lots of utilities. Write for our 3 page catalog, or take advantage of our special offer: Purchase both collections 1 & 2 for only $99 (over 60 Windows programs for use in Microsoft Windows!!).

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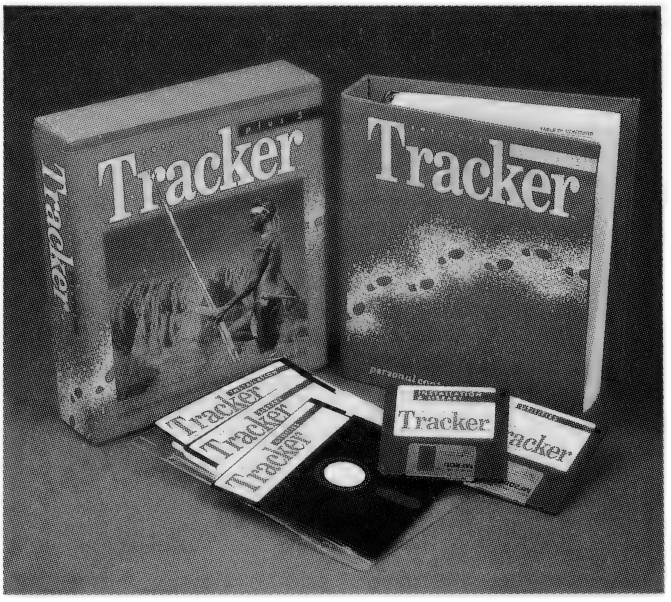
Fax (07) 808 7133

years long. Quick Schedule requires 384K RAM and Dos 2.0 or higher; a graphics card is not required. Labels Unlimited has 16 standard label formats, including those for name tags, audio and video cassettes and inventory. The packages allows five character heights which can be mixed on a single label and labels can range from about 10 *x* 25mm to 27 *x* 33mm, with a variable number of liners per label. Labels allows 400 labels per file and individual labels or only part of a file can be output. Dos 2.0 or higher and 128K of RAM are required. Calendar Creator allows a wide variety of date formats, from daily to six weekly to annual. Calendar events can be fixed (same date every year) or floating (dates such as the last Wednesday of every month) and exceptions are automatically catered for (when the date falls on a public holiday, for example). Events can be sorted by time, consolidated into a master calendar and have priorities assigned to them. Calendar Creator required 320K of RAM and Dos 2.0 or higher.



Tracker Plus
Sourceware

Ph: (02) 427 7999
Fax: (02) 427 7642
Price: $495

Tracker Plus has been improved with the release of version 5. The report section now features a menu-select for mail merge from the most common wordprocessors, including WordPerfect, WordStar and MS Word, as well as Ventura Publisher. Keyboard macros now carry additional commands plus naming and listing facilities. Notepad proportions can now be changed on-screen and for printing, plus there are new margin options for increased flexibility. Version 5 also has additional '&' commands and ampersand commands can be directly entered into the notepad. A four-user network version is priced at $1995, with four-user add-on packs, $995.

Symphony 2.2
Lotus Development

Ph: (02) 287 1900
Fax: (02) 261 2825
Price: $1150
$1295 Server
$795 Node
$250 Upgrade

Lotus Symphony 2.2 now features file linking with previous versions and Lotus 1-2-3 2.01 and 2.2, file previewing similar to Lotus Magellan, and improved support for expanded memory (up to 4Mb). The file linking facility lets users link a cell in an active worksheet (in memory) to cells in worksheet files on disk. The software automatically updates linked cells with the latest data whenever a file is opened. With the Magellan type file facility, users can locate and preview Symphony and Lotus files, as well as dBase and ASCII files. Expanded database capabilities and direct access to a disk-based database through an @Base add-in are provided in this new version – this allows users to access, modify, create and manage dBase III files from within a Symphony worksheet. Cells can now be edited directly from within the spreadsheet publishing feature, Allways. There is also an enhanced Step mode for macro debugging and 25 new printer and display drivers.

EnerCharts 3D
Technical Imports

Ph: (02) 922 6833
Fax: (02) 925 0311
Price: $350

Enertronics' new release of EnerCharts 3D runs under MS Windows and is used for the generation of three dimensional pie, bar and line charts, which can be viewed three different ways: perspective, isometric or oblique; the offset and thickness of pie

MicroGram COMPUTERS

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* 8748/49/50/41/42 Writer Card **$650.00**
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* PAL Programmer Card **$650.00**
* Universal Programmer **$1460.00**

EEMS CARDS
* Capacity 2Mb per card, 4 cards per system
* Will backfill conventional memory to 640kb.
* Comaptible with EMS and EEMS memory to run with Lotus 1-2-3, DESQview II etc.
* Driver software included as well as print buffer and RAM disk utilities. (includes LIM 4)
* XT or AT versions 0kb RAM **$230.00**

TVM MONITOR PARTS
* Fly back transformers, power supplies and circuit diagrams to suit MD3, MD300, MD7, MD700 and MD11 monitors.

BAR CODE READERS
* Selectable keyboard interface (connects between keyboard and computer) or serial interface.
* Bi-directional scanning.
* Will autodiscriminate most barcode symbologies eg.UPC/EAN/JAN/Code 39/Interleaved 2 of 5.
* Barcode printing software included. **$450.00**
* Barcode slot reader with above features. **$615.00**

"EXTERNAL" FLOPPY DRIVE CONTROLLER
* Allows two addtional floppy disk drives to be fitted (beyond A: and B:)
* Supports 360/720/1.2/1.44 on both XT and AT computers
* No need to replace existing hard disk floppy disk controller cards
* "External" drive(s) may be mounted internally with 34 pin header and ribbon cable or externally via 37 pin D connector. **$135.00**

5m PRINTER CABLE
* Standard IBM printer cable 5m long **$30.00**

TOPWARE LAN OPERATING SYSTEM
* Network up to 64 computers.
* 10Mb/sec Ethernet interface cards.
* Supports record locking with multi-user software.
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* Network software users familiar DOS commands.
* Shares all file server hard disks.
* Shares printers anywhere on the network anad allows output redirection with popup utility.
* Starter kit (Two interface cards, coax cable, connectors, software and manual). **$1100.00**

COMPUTER TERMINAL
* Compatible with PC Term, ANSI and DEC VT220 terminals.
* Uses standard PC monochrome monitor.
* Provides standard PARALLEL printer port.
* Suitable for use with Concurrent DOS, PC-MOS/386, MERGE 386, SCO XENIX, UNIX, THEOS, DEC VAX.

Price excl. KB & Monitor **$510.00**

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* Plug into motherboard expansion slot and switch on.
* Error code is shown on LED display indicating failure of one 59 possible tests.
* Where appropriate the manual indicates the area of circitry and / or the suspect IC associated with the error code.

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* Digitally store a human voice on disk.
* Playback through your own programs.
* 10 Bit sampling at 16K or 32K bits/sec.
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* Sample programs in C, Pascal, Basic and Dbase III, provided
* Microphone and speaker included. **$145.00**
* Addititional stand-alone card to play back 16 messages stored in EPROM **$149.00**

KEYPAD FOR LAPTOPS
* Provides an external cursor pad for Laptop computers.
* Plugs into 9 pin RS232C port.
* Software directs keypresses to keyboard buffer. **$160.00**

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* Provides stereophonic sound effects for Sierra and compatible games. **$255.00**

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* AT keyboard to PS/2 adapters	**$23.00**
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* Centronics gender changer M/M	**$12.00**
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* RS232 Loopback tester DB25 M/F	**$20.00**
* RS232 Pin 2/3 reverser DB25 M/F	**$11.00**
* RS232 Surge Protector DB25 M/F	**$20.00**
* RS232 Mini wiring box DB25 M/F	**$25.00**
* RS232 Mini tester DB25 M/F	**$60.00**
* RS232/RS422 Converter DB25 M/F	**$60.00**
* RS232 to Current Loop	**$190.00**
* RS232 to RS422/485	**$190.00**
* Parallel/serial converter	**$105.00**
* Serial/parallel converter	**$105.00**

SOFTWARE SECURITY KEY
* Protect your software from unauthorised copying.
* Consists of an ASIC based hardware device.
* Hardware is fitted to a parallel port and is transport to printers.
* Allows unlimited backups and software can run from hard-disk. **$75.00**

PS/2 MOUSE
* A two button mouse compatible with the IBM PS/2 computers.
* Tracking speed 500 mm/s
* Resolution 200dpi
* Includes driver software

$139.00

BUS MOUSE
* A three button bus mouse compatible with the IBM XT/AT computers and compatibles
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* Microsoft Mouse and Mouse Systems Mouse Compatible
* Includes driver software and menu maker software **$120.00**

PARALLEL PRINTER EXTENDER
* Allows a standard parallel printer to be operated at up to 1200m from the host computer
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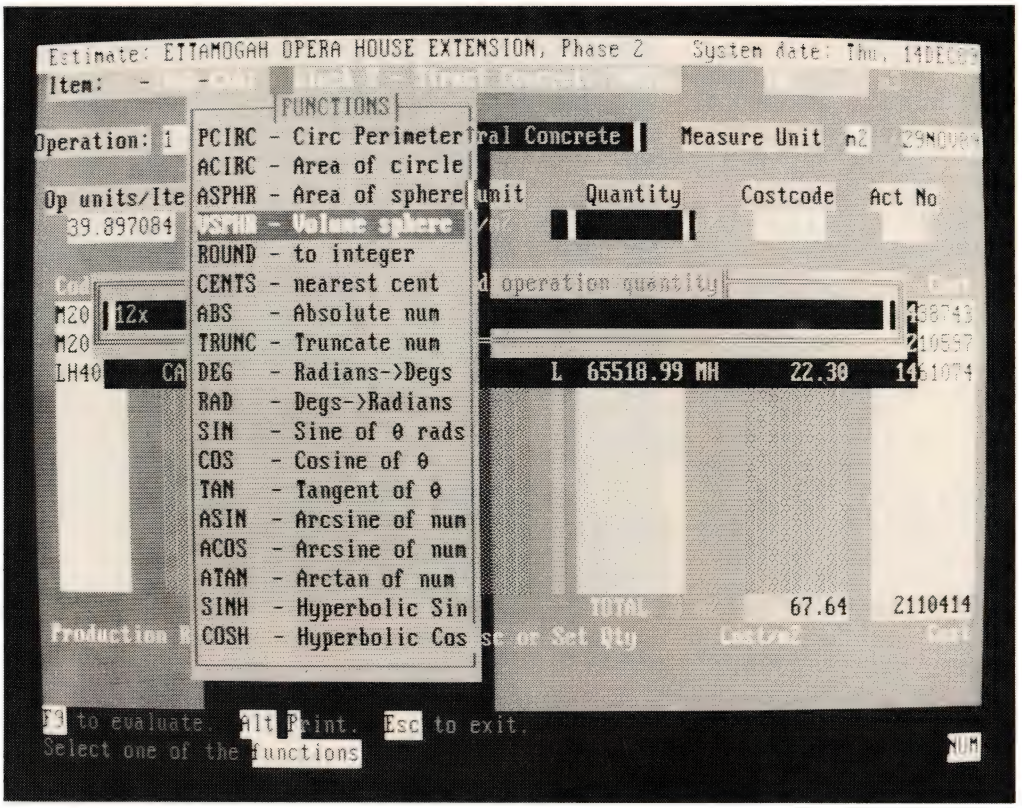
charts is controllable. The software allows interactive control of chart size, viewing distance and rotation angles and three different chart qualities: draft, fine B&W and fine color. The charting facility can handle up to 15 data sets with a maximum of 150 data points. Various fonts, sizes and colors can be set for text and legends, and there are special effects available for backgrounds and chart shadowing. EnerChart will interface with other Windows products including Excel and PageMaker via the Clipboard.



Clipper 5.0

Talsoft
Ph: (02) 317 4404
Fax: (02) 669 6864
Price: Not supplied

Nantucket Software has announced a new release (5.0) of Clipper, a comprehensive application development system for the PC. Comprising a core language system, a robust command and function set, pre-processor, linker, database driver, compiler and a comprehensive set of programming utilities, Clipper presents an integrated development system. Enhancements in the new release include an easy to use command and function set, combining the characteristics of general purpose languages such as C and Assembler with the data file handling characteristics of databases. Open architecture has now been extended to the entire system by adding user-defined commands and replaceable database and I/O drivers. There is also a new linker that improves memory management. New and expanded documentation is included, all of which is accessible on-line.

ProBid 8088

Procon
Ph: (02) 929 1086
Fax: (02) 907 9883
Price: $55 Evaluation pack

ProCon Construction Systems have announced a new version of their cost estimating and tendering system, ProBid 88. It now has

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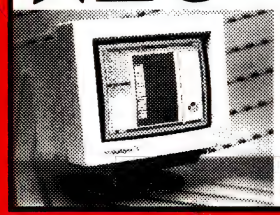

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- Analog & TTL

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- DOS 4.01 and GW Basic.

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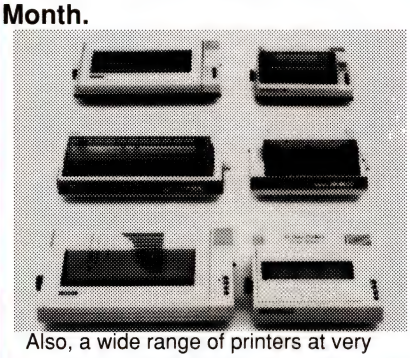

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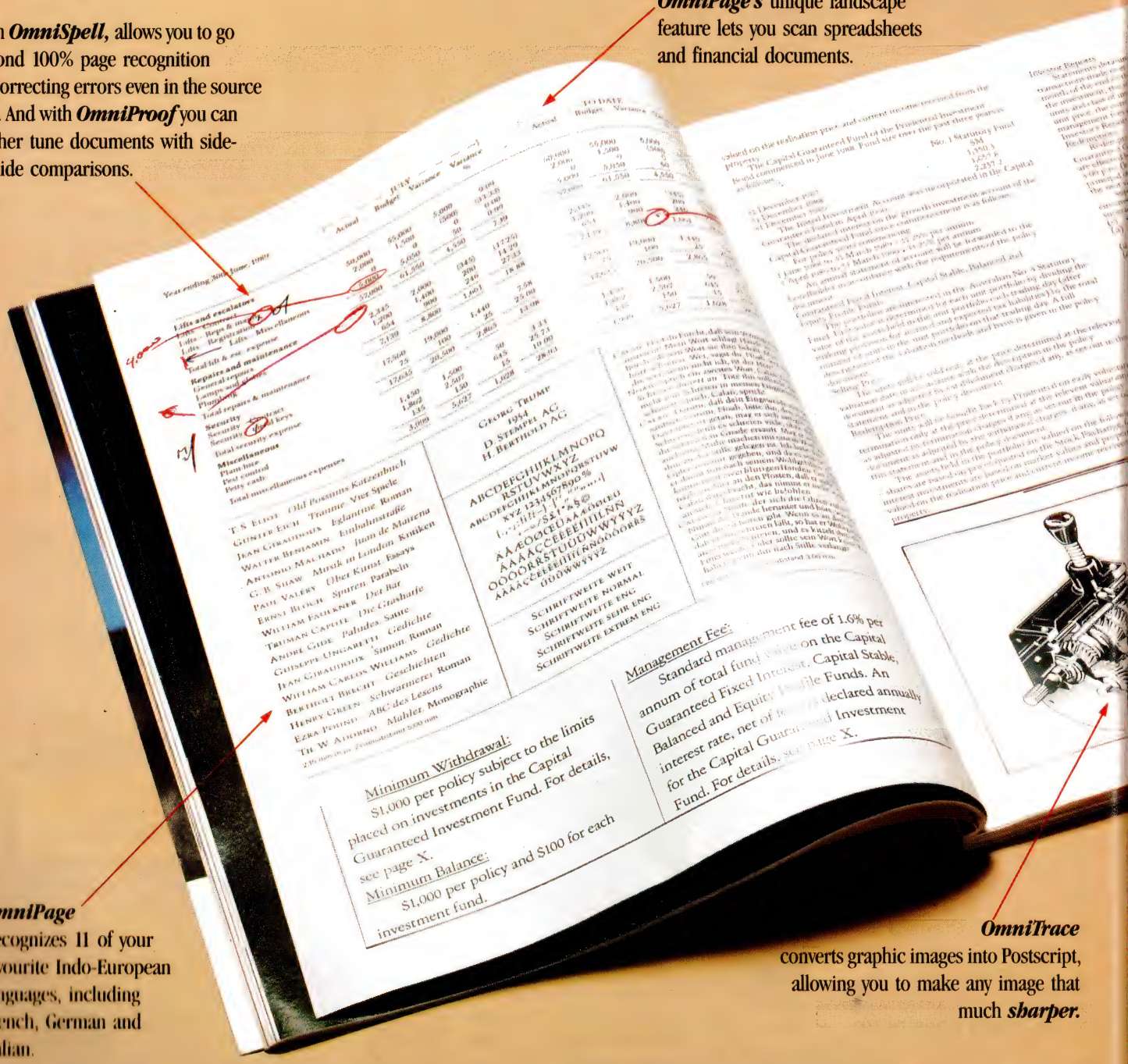

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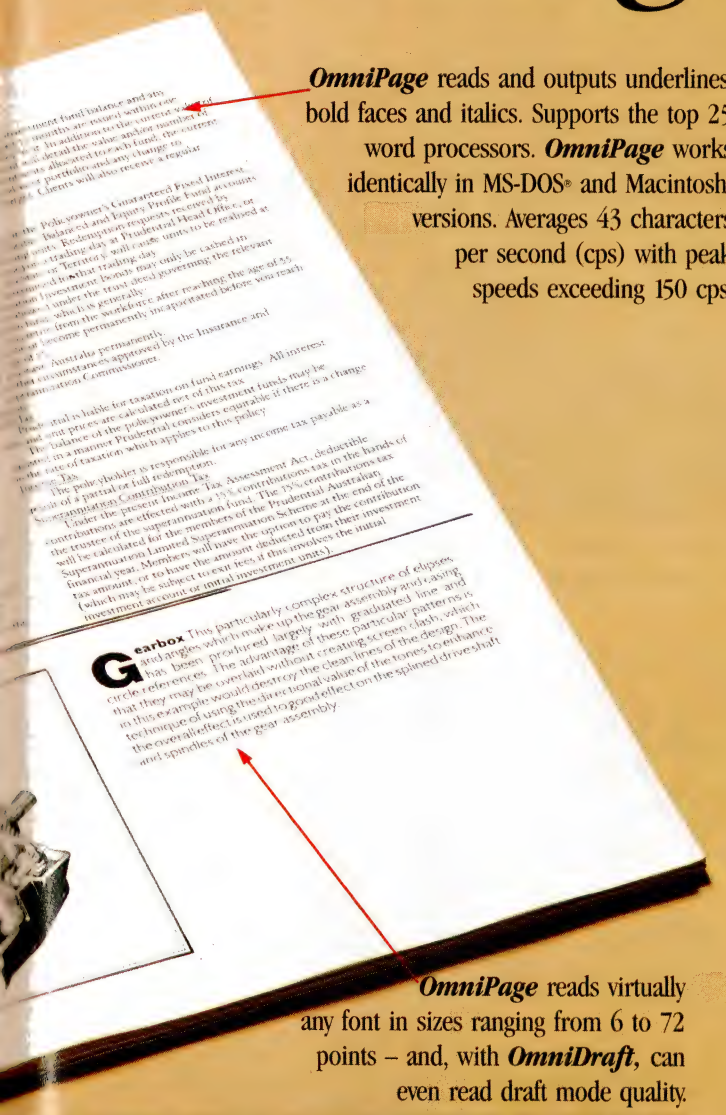

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P.D.Q. is a complete replacement for the BCOM libraries that come with Microsoft's QuickBASIC and BASIC 6.0. **P.D.Q.** is ideal for writing applications where program size and execution speed is critical.

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Best of all, **TSR** programming support and interrupt handling are built into the **P.D.Q.** library. You can create complete memory-resident applications in just minutes, instead of days or even weeks. **TSR** capabilities are added using four simple subroutine calls, and the **P.D.Q.** routines then handle all the details of memory allocation, the DOS "busy" flag, de-installation, and so forth. A **P.D.Q.** program can even intercept multiple interrupts if needed, with separate program entry points for each.

The minimum steps necessary to create a simplified pop-up **TSR** program are:

```
'*** Simplified PDQ TSR program
DEFINT A-Z                      'all integers, please
ID$ = "My TSR program V1.0"     'every program needs a unique ID
PRINT ID$                       'we might as well use the sign-on message

HotKey = &H81F                  'Alt-S
CALL PopUpHere(HotKey,ID$)      'specify the hot key
GOTO EndIt                      'skip over the hot key handler

                                'the actual program goes here, and it will be
                                'executed whenever the hot key is pressed.

CALL PopDown                    'return to the underlying application
EndIt:
CALL EndTSR(ID$)                'install as a TSR and return to DOS
```

Because **P.D.Q.** programs are inherently well behaved, they may also be run under operating systems such as Quarterdeck's DesqView and Microsoft Windows, without requiring any additional programming effort.

Full source code is provided for the complete **P.D.Q.** library and there are no royalty fees required for any applications produced for commericial use.

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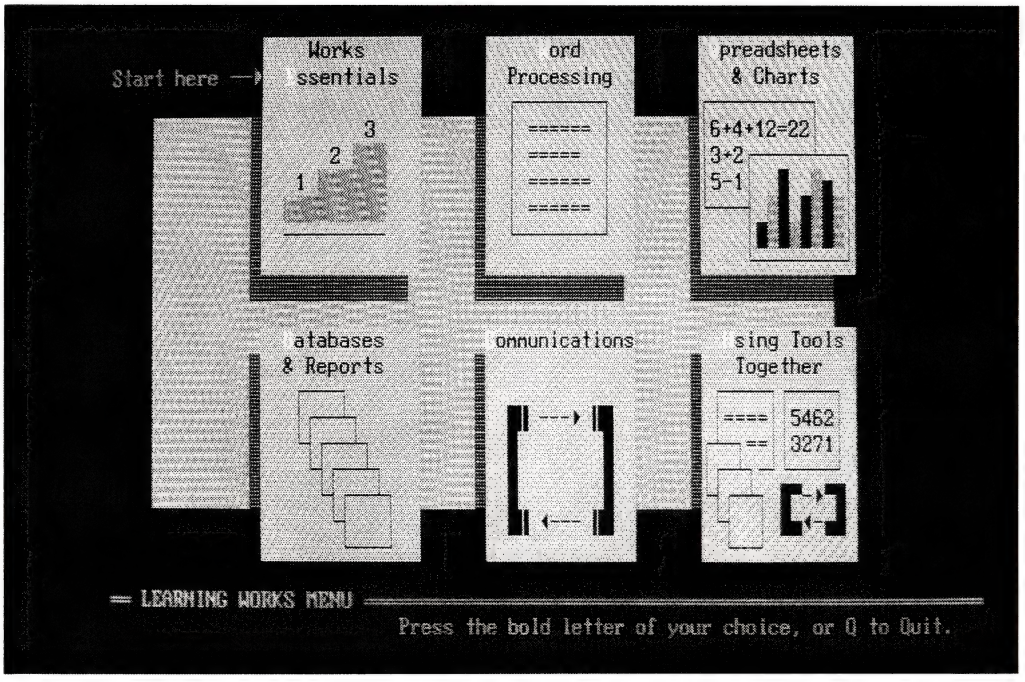
increased data capacity and allows users to manipulate the contents of their resource, item and assembly libraries with more flexibility. Designed for any type of contractor, manufacturer or fabricator using a PC, to define cost types and price work in as much (or as little) detail as possible. An estimator can use various types of resources, combine resources into assemblies or crews to as many levels of aggregation as required. Resources, assemblies and subcontractors can all be accessed from selection lists. The software allows the use of a digitiser to enter quantities or measurements. ProBid is compatible with Procon's contract billing and variation control program, ProBill, and its project scheduling system, ProPlan. An evaluation pack with a working copy of the program and documentation is available.



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Fax: (02) 452 4387

Price: $295
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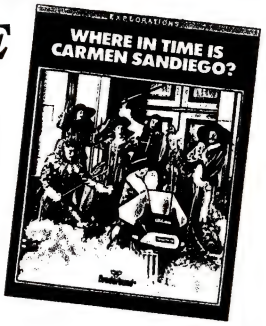

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Card and Board Updates

Vantage 386SX Motherboard

Western Computer
Ph: (07) 262 3122
Fax: (07) 262 4957
Price: $1000

To complement its range of accelerator cards and motherboards, Western Computer have released the Vantage '386SX XT board with a clock speed of 20MHz, and 1Mb of RAM. The board has provision for up to 8Mb of RAM, an AMI BIOS, 80387SX socket, five long expansion slots and two short.

LANtastic Ethernet Adapter

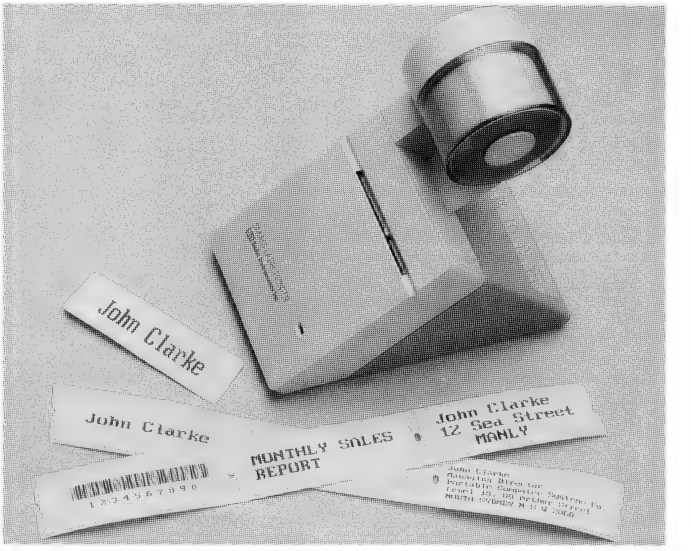
Multi Electronic
Ph: (02) 805 1055
Fax: (02) 805 1583
Price: $479 AE-2 adapter
$984 Ethernet starter kit

Artisoft's AE-2 Ethernet is a 16-bit adapter with 16K RAM (expandable to 64K), but it automatically switches to 8-bit if placed in a short slot. Designed as an enhancement to Artisoft's LANtastic Ethernet, the AE-2 markedly improves the performance of networks running NetBIOS. The adapter has a jumper which allows it to be used with TCP/IP or NetWare. The AE-2 offers optional diskless remote booting, selectable I/O addresses and support for eight IRQs. The Ethernet starter kit includes two AE-2 adapters, LANtastic NOS (which supports up to 120 users), 7.5m of coaxial cable, terminators and documentation.

Other Updates

Smart Label Printer

Portable Computer Systems
Ph: (02) 954 3411



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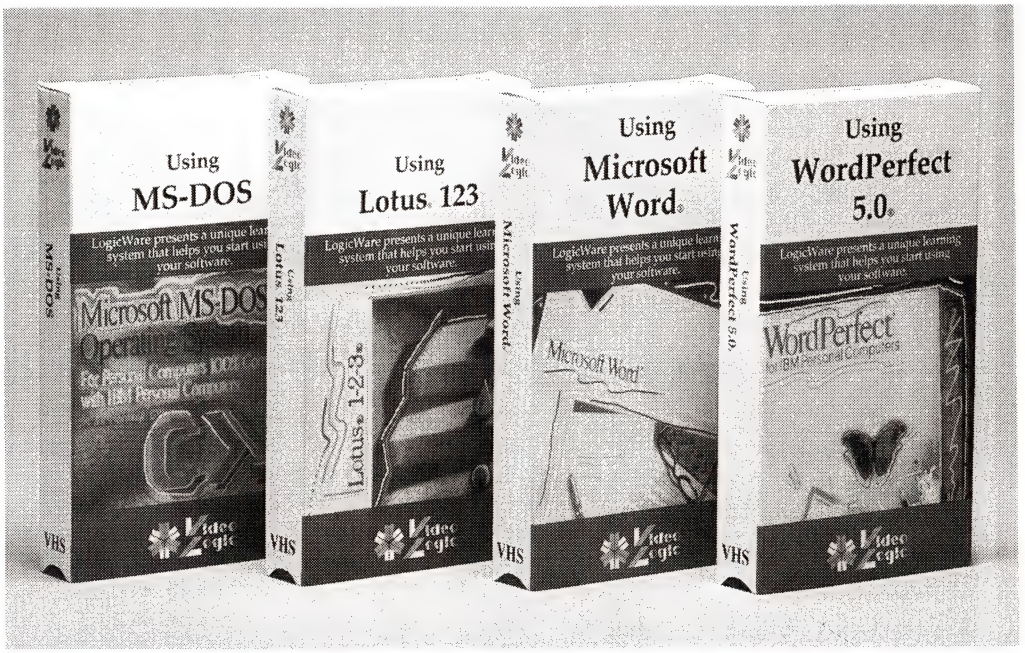
VideoLogic Learning Tapes

Nova Computers
Ph: (02) 399 5210
Fax: (02) 398 1823
Price: $49.95 each

Nova Computers has been appointed distributor for the well-known VideoLogic range of computer learning tapes – the company is currently seeking resellers in NSW and Victoria. While the library of tapes is continually growing, the most popular titles



are Introduction to PCs, WordPerfect 5.0, MS Word, MultiMate Advantage II, Lotus 1-2-3, Borland's Quattro and Tandy's DeskMate. The 30- to 45-minute tapes not only provide a beginner's tutorial, but they give an overview of the products so they can also be used for a simple comparative evaluation. Contact Nova for a catalog of new releases. □

NEW THE ENCYCLOPEDIA OF SHAREWARE

What is Shareware...
and why is a Directory important?

How it works

Shareware relies upon the honesty of software users to pay for the software that they use.
Shareware bypasses the costs associated with conventional marketing and promotion of software by inviting users of software to give copies of the software to their friends.
If the user of the software likes the product and wants to continue to use it in any way then the user should register that software.
When a user registers the software the author gets a return for his effort in creating the software and is encouraged to improve the product and to develop new products.
Rather than implementing cumbersome copy protection schemes shareware authors do exactly the opposite — they actually encourage their users to make copies of the software for their friends.
Word would spread slowly if the author solely relied upon users just sharing copies with their friends. User groups are encouraged to share the software with their members on a non profit basis.
Many user groups set up Bulletin Boards so that members can "down load" software which they would like to evaluate for use. This is another accepted way of distributing shareware.
Some commercial operations also distribute shareware and charge for the disks. Again this is an accepted way of distributing shareware providing the disk distributor meets certain criteria set down by the authors.

What is the difference between Shareware and Public Domain Software?

Public Domain software is created by authors who chose not to seek formal rights or royalties. There is no restriction of any kind on distribution of this kind of software. Most public domain software is games or utilities. There are very few complete products in the public domain.
Shareware software on the other hand is distributed so the user can evaluate the software to decide whether he will register with the author and continue to use the software.
Shareware is an alternate method of marketing software, not really a different kind of software. In fact the more successful Shareware products hold their own against their commercially distributed competitors. The greatest difference is that the Shareware product's packaging is not as fancy and the price is much lower.

Where can I obtain Shareware trial disks?

A collection of Shareware disks is usually referred to as a Library. A Library may be kept by a user group, a bulletin board operator or by a commercial diskette distributor.
A lot has been said and written about viruses. There is no doubt that a virus could be distributed hidden in a public domain or shareware disk.
Care needs to be taken that the library you use for disks takes every reasonable step to eliminate the possibility of a virus. Careful checking is not sufficient as it is simply impossible to check every single disk to the degree which would be required.
The safest way for your library to obtain Shareware disks is to source them directly from the authors. This of course means that the source of every disk is known and the insidious perpetrator of a virus cannot hide behind a cloak of anonymity.
The Shareware authors are always releasing new versions of their software and you should ensure that the library is kept up to date with the latest available versions.
Before you purchase any disks you should ask if the software and the latest versions are sourced directly from the authors. If the answer is "yes" you can be reasonably sure that you are getting the latest versions and that they should be quite safe to use.

Do I need to join a Library?

Some commercial libraries and most user groups insist that you join before you can purchase disks. If you intend to purchase disks a properly prepared catalogue will make your selections easier and repay your membership costs many times over.
Other libraries allow purchases without any membership fees and some offer a free catalogue. The free catalogue is usually a very short description of available disks and is often given away as an insert in magazines. Of course there is no such thing as a free lunch — the brief descriptions in free catalogues mean that you will invariably purchase more disks than you really need. The descriptions are so short you really are taking a lucky dip!

What is PC-SIG?

PC-SIG is the world's largest Shareware library and contains around 1500 disks. PC-SIG does not require you to become a member to purchase disks and gives you a choice of Directories to suit your requirements.
PC-SIG are the publishers of a bi-monthly magazine, appropriately named "Shareware". The magazine lists new additions, upgrades to existing disks and compares products from different authors. "Shareware" is available at many newsagents in Australia at around $4.50 an issue or on a twelve month subscription basis for $20. Subscribers to "Shareware" also receive FREE a 48 page mini catalogue of the PC-SIG Library.
NEW from PC-SIG is the definitive reference work for tracking down the Shareware product you need. With nearly 500 pages of detailed descriptions of the programs in the PC-SIG Library "The Complete Encyclopedia of Shareware" provides a wealth of carefully organised information to help you find the product you are seeking. You can look up a program by subject category, title or disk number. There are even handy "see also" notations to direct you to other programs which may suit. The Encyclopedia is exceptional value at just $32.50 (plus $5 post and handling).
If you chose to subscribe to "Shareware" and to purchase "The Encyclopedia" you can become a member of the Library for just $38 (plus $5 post and handling). You will not only have the best reference work available but be kept up to date for a full 12 months with "Shareware" magazine. As a further bonus members are offered special discounts from time to time.
You do not need to be a member of the Library to purchase PC-SIG disks. Five disks are just $50 and then additional disks are just $5 each.
Libraries often represent that they offer PC-SIG disks BUT unless the disks are grey and carry PC-SIG's logo they are not genuine PC-SIG disks. PC-SIG cannot take any responsibility or offer support nor the money back guarantee on such disks. Invariably these libraries do not bother updating to the latest version at all, or at best they will update from time to time so they can claim that they do update.
To ensure that the library contains the best quality products no disk is added to the PC-SIG Library unless it is obtained directly from the author. There can be no anonymous interference with PC-SIG disks!

Are registered Shareware copies available in Australia?

PC-SIG's distributor in Australia, Manaccom, offers the full PC-SIG library and also has arrangements with many Shareware authors to represent them in Australia. Yes, the complete registered packages with manuals and access to upgrades are available right here in Australia. If you return the PC-SIG Shareware disk when investing in a registered copy you will be refunded $5 per disk.
This means that the trial could be at no cost if you decide to continue to use the product.

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JOHN BAILEY

Expressions and impressions

DURING THE Federal election, the press whipped the campaign into a lather of blather. This excess of verbiage reminded me of the need for clarity of expression in the creation of computer software and manuals. I have been waiting for several packages to arrive in order to compile this month's offering, and now that they have come, I find that each will need a lot more work and an article to themselves. In their own way each package is a good example of invention; necessity being its mother. So much computer software is just the same thing done again and again. A classic example of this is the plethora of cheque book balancing programs and spreadsheets that exist. I don't think that it makes sense to use a computer for a simple addition and subtraction task. Every programming class develops some sort of accounting program, but nobody tries to develop statistical tools to analyse the growth of a region or ecosystem, even though the principles are not very different. If we can pretend to predict a fiscal future with a computer model, why not use the computer to predict an environmental future? After all, money is only one of the three resources (land, labor and capital) of Keynsian economics.

I sometimes think that computer applications should have a complete manual written and published before a single line of code is written.

We need to ask how much of each resource is spent each year and how much can we replace? What is the function of each participant in the system? If the past is like this, will the future be like that? Or, are there other effects? Perhaps a bright computer class will produce an environmental management system for a swamp somewhere, at least it will be different.

The software that I have to study consists of three packages: a farm management analysis package called FarmAssist, an expert system that is devoted to the selection of herbicide sprays and their application, and the last is a flight planning package for the general aviation industry. Each package has been devised as the answer to a definite need, and all of the original problems presented massive amounts of paper work or were insoluble without the use of a computer.

If we can pretend to predict a fiscal future with a computer model, why not use the computer to predict an environmental future?

FarmAssist

THE FARMASSIST package came about because of a share-cropping partnership. The share-farmer asked the owner why certain paddocks did better than others, and what was the real cropping expectation from a certain district? The owner had a stack of detailed records covering weather conditions, fertiliser inputs, planting details, livestock data, sprays used, and other management information. All of these records were on paper, but the task of compiling tables and drawing statistical inferences or making graphs on paper was too great. By using a computer, they have come up with a recording and analysis package that is probably the best single reason for owning a farm computer that I have seen. It does not supply immediate cut and dried answers, however, it does provide the graphs and tables that allow the information to be interpreted.

The herbicide selection software has been developed by John Moore, an officer of the Western Australian Department of Agriculture, and his 16 year-old son. Modern agriculture demands that we produce food as efficiently as possible and without damaging soil structure. On fragile soils, the surface must be protected from erosion, and in some areas cultivation will decimate the valuable worm population so chemicals can provide a solution to all the conflicting needs of the people.

In the course of his work (crop research) Moore became more and more aware of the confusion in farmer's minds over the types and usage of the many herbicides available. The information can be presented in book form, but by the time a book is compiled, printed and distributed, it is out of date due to changes in application techniques and/or the chemicals available. The expert system first designed by Moore and his son uses data from all states of Australia, but is more specific to Western Australian conditions and provides the answer to the problem of a rapidly changing set of data affecting the use of herbicides. The latest version of Herbiguide is still being tested, but will include a weed identification module to help users select the correct chemical.

Flight Planner

THE MOST RECENT package to come to my notice is the Flight Planner from Champagne PC services, and perhaps this is slightly less innovative than the other two in that it does the same sorts of things that pilots have always done, but it does them better and a lot faster. In private flying, cost is a factor that must be resolutely ignored, but for commercial operators it is crucial and small differences in schedules and procedures can add up to large savings. I sometimes think that computer applications should have a complete manual written and published before a single line of code is written. By that criterion, Flight Planner must be a very good software because they have taken the existing system and produced a computer program that operates within that system. The fact that the 'manual' has been devised by a bureaucracy that still can't make up its mind about flight plan forms makes the software even more commendable for its flexibility.

I would not presume to try and name a Rural Software Package of the Year, but if I did, the selection criteria would be pretty simple. One, does it do anything useful for us that we couldn't do before? (Would I miss it if it wasn't invented?) Two, does it express its aims and desires clearly? I have called this article 'expression and impression' because 'communication' is overworked and gives me visions of those personal communication workshops where people sit around 'relating' to one another intensely. I had originally planned to do the usual beat-up on each package, but an interview with Maurie Booker about FarmAssist made me think about the essential qualities of good applications.

Essential qualities

AT FIRST GLANCE, each of these software packages shows clarity of expression. In the case of Flight Planner, the pilot or operator is using standard flight details and the result is in familiar terms. The only difference between using the computer or a pencil is in speed and accuracy.

I don't think that it makes sense to use a computer for a simple addition and subtraction task.

Herbiguide selects a range of chemical mixes for any given situation defined by the user. The difference between looking up a weighty tome and using Herbiguide is speed, and the program doesn't get dog-eared nor do you miss something obscure. It is also faster than ringing up an expert like Moore because you don't get side-tracked into other fascinating aspects of his research.

FarmAssist is also a program that was written to fit the manual. The data entry screens are the same as the recording sheets used in the paddock. The entry techniques are designed for hunt and peck typists, and the analysis of the information is presented as graphs according to the wishes of the operator.

The necessity for speed in compiling flight plans, finding the answers to agronomic questions, and analysing a mass of farm records, prompted each of these programs, but they all progress beyond that stage to assist the user.

Each of these packages will be fully discussed over the next few months, but if you desperately need to buy now, you can get FarmAssist from Maurie Booker, 43a Labouchere Rd, South Perth 6151 WA; Herbiguide from Albits, PO Box 44, Albany 6330 WA; and Flight Planner from Champagne PC Services, PO Box 89, Belmont 6104 WA. □

The necessity for speed in compiling flight plans, finding the answers to agronomic questions, and analysing a mass of farm records, prompted the development of Flight Planner, Herbiguide and FarmAssist, but they all progress beyond that stage to lend real assistance to the user.

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STEWART FIST

The joys of networking

WE HAVEN'T TALKED much about local area networks (LAN) in this column over the years, mainly because I don't use one regularly myself and I figure that most of the readers of this magazine don't use them too much either.

But there's no doubt that the use of LAN technology is rising, and it is an area that everyone now needs to know something about – even if only to reject it as a solution to small business problems. There are a lot of LANs in use which have decreased the efficiency of a lot of companies. Often, Sneakernet (taking a disk in hand and carrying it) is the best solution to office communications problems.

But obviously, in situations where the shared use of a constantly updated database is the primary reason for computerisation, a multi-user system or a network link is the only logical solution.

Fortunately, the Macintosh on a LAN is a far better performer than IBM-type systems, and this has made AppleTalk/LocalTalk the most widely used LAN in the world, even if these are often simple applications, like sharing a laser printer. Apple's LocalTalk is cheap to install and easy to use, so it has applications in performing these simple tasks where you wouldn't think of using a more complex system. Fortunately, it also performs well on the more complex tasks.

The Mac II was the first machine in the Apple line that allowed background LANs activities to be performed while you continued with your application-of-choice in the foreground, and the new Mac operating systems soon to emerge from Cupertino (beginning with System 7.0) are tailored specifically for LANs operations. Apple's idea is to create a simple standard at the machine-operation level which will allow hardware manufacturers and software publishers to create products which share information easily – and in many cases, automatically. If they can do this, they'll move the Mac even more into centre stage in the business computing world.

The Mac was, in fact, the first general purpose PC to have LAN functions built-in. Right from the start, Steve Jobs believed that the future of the Mac system lay in interconnection, and when the LaserWriter concept came into being, it became obvious that networking would be a necessity. In those days, laser printers cost an arm and a leg, so it was assumed that you'd only have one to an office. And, unless you could afford to have a dedicated Mac permanently connected to it to drive the printing operations, a LAN was the only alternative. But it didn't need to be a high-performer – just a steady source of data at a reasonably leisurely pace.

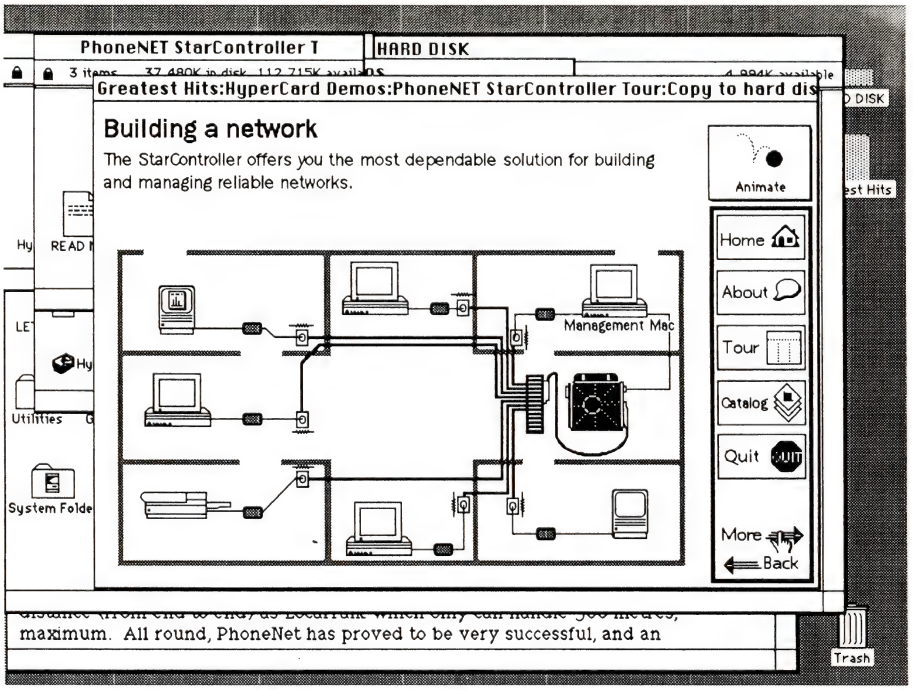
LocalTalk

YOU MAY NOT think of something as simple as a couple of Macs connected by LocalTalk links to a LaserWriter as a network, but it only lacks the software controls for contention and access, to make it one. At this most basic level it performs little more than your RS-232 cable to your printer, but it is the basis on which networking is built.

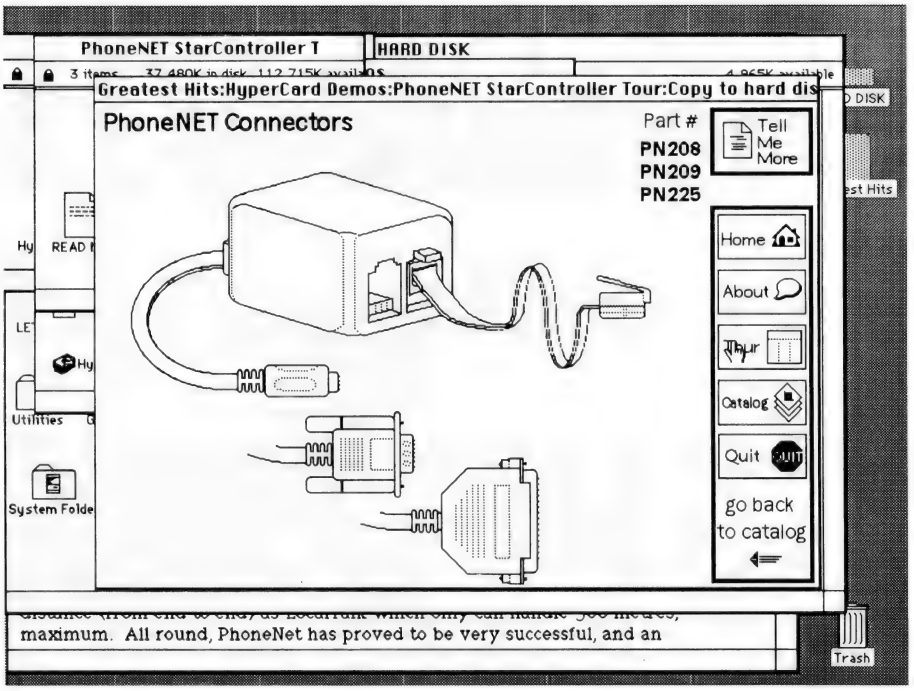
The term LocalTalk now refers to the physical hardware, and AppleTalk to the protocols used on the system, but at one time the term AppleTalk was used to refer to both. I still have trouble remembering to separate them!

LocalTalk uses a twisted-pair cable (almost the same as your phone line) with additional interference and physical protection from flexible metallic-mesh shielding. The shielding is earthed to cut any stray magnetic fields or conduct any unwanted electrical currents straight to earth and dissipate them.

All computers and peripherals on the network are connected to an AppleTalk network in a simple linear bus (a 'daisy chain' linking) topology with the shortest possible cable lengths between 'nodes' (devices), and with each end of the chain terminated. This termination happens within the end LocalTalk connectors



PhoneNET's StarConnector allows the cable layout to form a star network. It still relies on the AppleTalk protocols, but uses the spare pair of wires found in most existing telephone extension cables.



The use of standard modular phone cables gives the PhoneNET system a major cost advantage over Apple's LocalTalk.

(small boxes at the junction of each node's cable with the bus) and it is essential to prevent echo and confusion in the system.

If you remember your physics: in organ pipes and flutes the sound waves generated at one end travel down the length of the pipe where they reflect back from the open end. It is this internal reflection from a junction with space that reinforces the vibrations and creates the note. Frankly, I've never been able to make sense of explanations as to why sound reflects back from an open end, but organs and flutes seem to work, so I guess we've got to accept the claims.

If you have a daisy-chain of computer and peripheral nodes with signals traveling up and down the chain at near the speed of light, they will strike an open end (a non-terminated end device) and echo back. These reflections will mess up the system because confusing signals will be flying around. You find this problem with SCSI daisy-chains also.

So termination is essential. It consists of placing a dummy electrical load (a 100 ohm resistor) across the ends of the twisted pair so as to dampen the echo by absorbing energy no longer needed. This is probably the first thing to be checked if you've got scrambled data on your network.

When the original AppleTalk system came on to the market it was able to address only 32 nodes. Each device on a network needs to have a unique address (always a number), and if only five bits are reserved for the address, then 2^5 equals 32 nodes are the maximum number of devices addressable. Later they extended the address to 8-bits, and 254 nodes.

Apple have progressively removed these address-size limitations, and now with AppleTalk Phase 2, a node can address just over two million nodes – although common sense tells you that you'd never swing this many nodes on a single LAN. The expansion in the addressing capability is now catering to the fact that people are increasingly involved in internetting – joining LANs together into gigantic mesh networks.

You won't want to swing too many nodes on a single AppleTalk/LocalTalk network anyway, because the rate of data flow is limited to 230 kilobits per second which is quite slow by comparison with Ethernet and the Token Ring system. AppleTalk is also a contention system (as is Ethernet, but not Token Ring) which means that all nodes on the network 'contend' for access whenever they want to transmit – there is no over-riding 'adjudication' authority that makes these decisions.

When a gap occurs in the signals running past on the chain, all contending nodes jump in and try to transmit – then, if data collisions occur, they all go into a quiescent phase for randomly chosen fractions of seconds, and then try again. Since the delay times are random, one node should be able to transmit first in the clear, and the others later.

This lottery approach to providing access works well up to the stage where there is a moderate loading on the network. But as more and more nodes come onto the system, the rate of data collision will rise out of all proportion to the increased number of users, and at levels of above 80 per cent of theoretical capacity, the network becomes almost unusable.

So AppleTalk networks work best as work-group links, between small numbers of Macs and peripherals requiring low data speeds, and with gateways carrying the data to other self-contained networks, when needed. You may think of this as a limitation, but it also seems to be the most practical design for networks on the whole, which is another reason why AppleTalk has been so successful.

If you've thought about it, you probably have an image of the electrical signal transmissions on a network as something similar to the signals of modems. Or, perhaps, you view the signals as DC voltage changes? In both cases the transmission medium varies between two states (two audio frequencies, or two DC voltages), and both sender and receiver have synchronised clocks to count off a chain of zeros, or a chain of ones. If these are images you've got about AppleTalk, then I'm afraid you are wrong.

The twisted-pair wires in the LocalTalk cable are driven as a balanced pair, with the voltage fluctuating between about +12 volts and -12 volts. Each wire carries a mirror image of the other's voltage so they are always balanced, and therefore, well protected from transient electrical or magnetic interference. The voltage alternates at AppleTalk's 'normal rate' of 230,400 cycles per second – but (and here is the key) it is capable of changing twice as fast.

On AppleTalk, it is the time between a voltage change that signals a zero or a one – not one state or the other. If the lines stay in a stable state for the duration of the 'normal' cycle time of 4.34 millionths (1/230,400) of a second, then the signal is

read as a one. However, if there are two cycles within this time (obviously each occupying 2.17 millionths) then these two (jointly) are read as a zero. So what we have here is really a frequency modulation system: one cycle of 230.4kHz is read as a one, and two cycles of 460.8kHz are read as a single zero.

Since the AppleTalk 'decoder' only has to identify these time-slots with an accuracy-window as wide as a two-to-one ratio, it is particularly immune from noise. This reading of cycle times is relatively easy for electronics to do these days, and any change which is not part of a cycle (noise, interference, and so on) can be identified and rejected.

Alternatives

FARALLON, WHO MAKE Timbuktu software and a number of other interesting pieces of hardware and software (including the MacRecorder), produced one of the most interesting alternatives to the LocalTalk cabling system, but they used the same AppleTalk protocols. The call their hardware variation PhoneNET because it uses standard unshielded twisted-pair telephone cables and standard 'phone jacks'. The local distributor is modem-maker NetComm; (02) 888 5533.

PhoneNET has become popular because many offices are wired with 4-wire telephone cable, where only one of the two available twisted-pairs are used by the PABX-to-telephone terminal connection, leaving the other free for PhoneNET. So you can make up your own PhoneNET cables easily with standard phone wire yet, despite its lack of shielding, PhoneNET operates over about three times the total network distance (from end to end) as LocalTalk, which only can handle 300 metres, maximum. All round, PhoneNET has proved to be an excellent and versatile product, which is proving to be very successful financially for Farallon.

PhoneNET hardware consists of a connection box and cable just like LocalTalk's. The difference seems to be mainly with the impedances of the connectors – these basic connection boxes are little more than a transformer and a couple of sockets. On any bus network, the connectors need to handle data traveling along the cables in both directions because there isn't any 'correct' way to communicate in a linear bus system.

The primary coil of the transformer provides the coupling between the two sides of the daisy-chain, and the secondary coil feeds the cable going to that node's computer or peripheral. Each balanced cycle saturates the magnetic core of the transformer, and when this magnetic field collapses (which it does in any transformer when the cycle reverses or is cut off) it will output an identical signal on the other side in the path leading to the next connector. Thus, the signal transits the daisy-chain in a series of discrete steps.

The newly generated signals are each slightly delayed in time because they are generated by the collapse of the magnetic field. Therefore, it is important to realise that propagation down the daisy-chain is slower than the speed electric pulses could move through a cable system if they weren't being captured and delayed at each node by the magnetic field of each connector's transformer. And, it is this propagation speed that sets the maximum distance and data rate of any network.

So it may seem that Apple have taken a rather limiting and primitive approach to designing the network, but it also means that their system is relatively cheap (no complicated electronics built-in to the connector), relatively damage-proof (transformers are robust), and electronically very simple.

The connector continues to function and pass on signals also, whether or not the node is in use. This is essential when you've got a bus-type network as you can't afford to have an open-circuit if one node isn't active or has problems.

This approach does call attention, however, to one relatively fundamental problem with LocalTalk-type linear buses. If one section of the daisy-chain is disconnected or faulty, the whole system goes down. Apple learned this to their cost in the early days with LocalTalk connector failures due to a simple friction-fit plug which would get loose and drop out. They have now replaced these plugs with a locking type connector.

PhoneNET call their device the StarConnector, and it allows the cable layout to form a star network. It still relies on the AppleTalk protocols, but uses the spare pair of wires found in most existing telephone extension cables. For the last few decades, Telecom have been using a four-wire cable for telephone extensions, even when only two were actually needed.

These cables are safely embedded in office walls and partitions where they aren't easily cut, and in most offices this cabling will already be installed – just sitting there waiting to be used. All you need to do is to put a central wall-mounted StarController for the LANs somewhere back near the telephone PABX switch unit. □

JOHN HEPWORTH

PC Write 'n' File

EVERY SO OFTEN it's time to pause and take a quick look at new releases of familiar Shareware products. Two of the best are PC Write and PC File. New versions of both have just appeared – PC Write Lite and PC-File 5.0. Both must be on the short list for anyone.

In the first week of March, Bob Wallace of Quicksoft, visited Australia and spoke to user groups in Sydney, Melbourne and Brisbane. He brought with him the first copies of his new product, PC Write Lite. Over the years, PC Write has added features, power, and some complexity. As a result, it moved above the entry-level to which it once aspired, and also took more disk space. What was urgently needed was a slimmed-down version for first users, with less demand on disk space, but with full functionality for the creative user. PC Write Lite was the result.

Searches are quite quick, but searching in indexed fields is very fast.

PC Write Lite will be familiar to anyone who has used previous versions of PC Write. Like them, it comes essentially as two programs. One creates and modifies files, and the other prints them out. PC Write Lite creates straight ASCII files with a hard Carriage/Return/Line Feed pair at the end of each line. Print control is achieved two ways. Character formatting, like underling or bold, is done by embedding a control character in the text at the start and end of a block of characters. As an example, underlining a block of text is done by placing the cursor at the start of the block and pressing Alt-I, and then doing the same again at the end of the block. Other operations are carried out with menus, or quickly and conveniently with WordStar compatible commands. Spell checking is provided, and one option that is very attractive to novices is the ability to check spelling as text is typed. Autosave at user-selected intervals is included.

Page layout, including margins, headers and footers, is controlled with dot lines. These consist of a line in the text with a full-stop character in the extreme left-hand character position. The contents of this line are treated as commands by the print-out part of the program, and the output is formatted accordingly. Margins and tabs are set by inserting ruler lines in the text. A ruler line is a line of ASCII text with symbols indicating the format to be followed from its location until the next ruler line is found.

System requirements are minimal. All of a PC Write Lite file is in memory while it is being edited, along with Dos and the program. As a result, a 256K machine running Dos 3.3 can edit files up to 50K long, and a 640K machine should be able to handle files of 400K or more. Two 360K floppy disks or one 720K disk are very desirable, though with a lot of juggling you could probably make do with one 360K drive. Most common video systems and printers are supported.

PC Write Lite comes with one of the best shareware manuals I have ever seen. It is just on 190 pages long, and is *impeccably* written, typeset and illustrated. On disk are two compressed files which, in 85 printed pages, cover essentially all of the same material, with some variations for the different format.

PC Write Lite has removed very few desirable features from its higher-featured brother, which will still be available. These are mail-merge, multiple columns, proportional fonts, automatic indexes and tables of contents, and some other uncommon functions.

PC Write Lite is a fast and convenient way to create text files of any type, and is ideal for use with all laptops with a single 720K drive. It can be confidently recommended to all, novice to intermediate users.

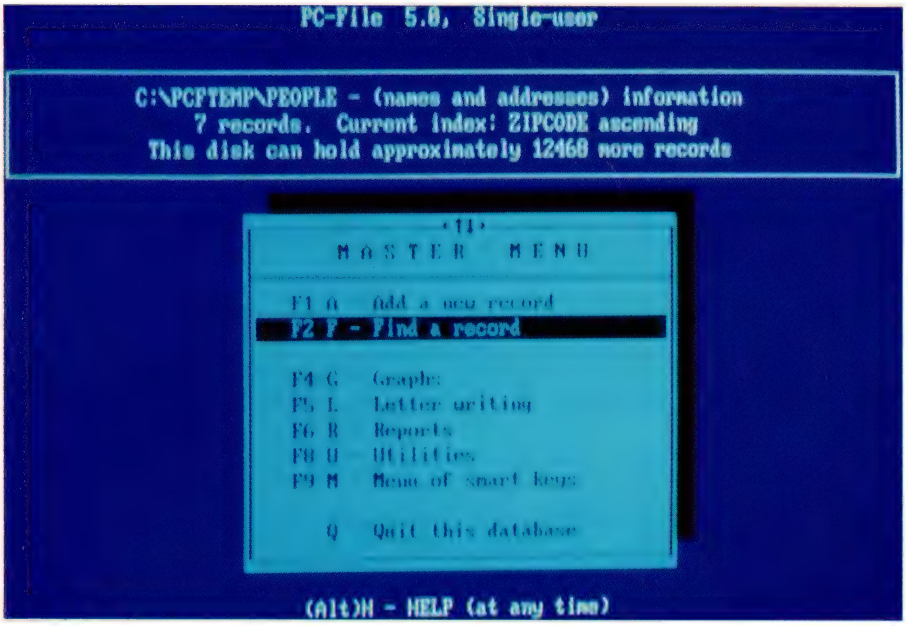
PC File 5.0

THE KING OF the shareware databases is PC File, which has held that position for five years or so. The latest version is titled PC File 5.0, and is even more powerful. As before, it is a menu driven database without a programming language. A few specifications will indicate just how powerful it is. PC File 5.0 can have one billion records per database, with up to 128 fields per record and 254 characters per field. Memo fields are supported, and can be up to 5000 characters long. A LAN version is available so that multiple users can simultaneously access a database.

PC Write Lite comes with one of the best Shareware manuals I have ever seen.

Data is stored in the data file in random order, using a dBase compatible file format. Indexes are used to display records sorted in the desired order, and these are seen one at a time, or can be in a spreadsheet-like format in browse mode, with one line per record and the fields one after the other across the screen. A PC File 5.0 database can have up to nine indexes, and the user can define the name of each index file, with the default being the name of the field being indexed. An index can be user-defined, and in this case is based on the contents of multiple fields. The indexes are automatically updated as records are added, deleted or modified. Selecting a different index takes only a couple of keystrokes, while creating a new index, even with complex user-defined relationships, takes little more.

Searching for data is very easy. Start up PC File and load a database. From the PC File main menu press F for find, and now pressing B for beginning jumps to the first record, E for end to the last record, N to the next record and P to the previous one. It's also possible to search for records containing particular data, and the criteria can include the contents of multiple fields. Soundex search, for fields that 'sound like' the search criteria, is particularly useful, as is a scan-across mode which looks for data anywhere in a field.



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Searches are quite quick, but searching in indexed fields is very fast.

A database can be defined literally in a minute or two, and can have up to five data entry screens per database. The user can 'paint' a screen layout if required. While there is no programming language as such, PC File 5.0 has Smart keys. These are macros attached to a convenient key combination and can automate quite complex tasks. Reports to screen, disk and paper are easy to define and can include sub-totals of numeric fields. PC File 5.0 has extensive export and import options for many different file formats, can graph the contents of databases, and generally has features far above those expected in a non-programmable flat-file program.

PC File 5.0 has extensive export and import options for many different file formats.

PC File requires a hard disk, or a floppy of 720K, for the program. Data files can be on any size hard or floppy disk. The review copy came with an excellent manual nearly 400 pages long. No manual was on the disks I received, but I understand that one is available in this form as well as the printed manual that comes with registered copies.

PC File 5.0 has many small but useful improvements over previous versions. Some are cosmetic, others are functional. Two are substantial improvements and are, by themselves, good enough reason to upgrade. They are the user-defined indexes and the optional LAN support. It doesn't matter which other database you use. PC File is vital for prototyping databases, for maintaining data files for MailMerge with your favorite wordprocessor, for personal (and business) databases, and generally for all those little database projects that you want up and running right now, without any programming. For every database I create with Clipper, I use PC File 5.0 for several others.

Availability

PC WRITE LITE and PC File 5.0 are both Shareware. Copies for evaluation can be freely made and shared, and are available from user groups and bulletin boards. PC Write Lite is around $120, and PC File 5.0 is $195rrp. Both are distributed by Manaccom, (07) 368 2366. □

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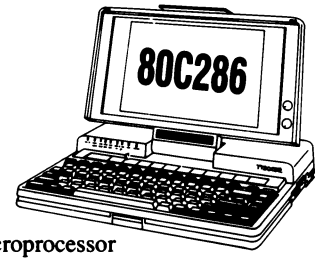

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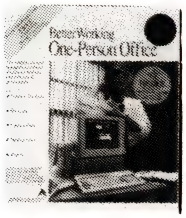

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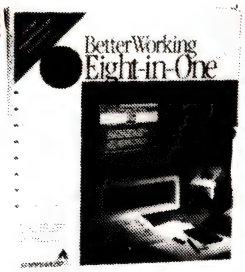

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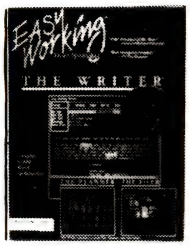

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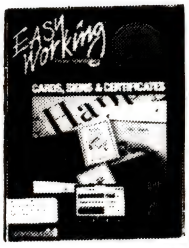

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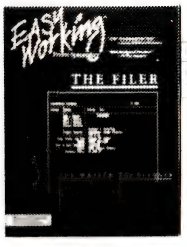

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JOHN HEPWORTH

PDQ QuickBasic library

WHAT PROGRAMMING language do you use? There's a host of them out there now, each with their adherents, each of them the height of fashion for a time. The big four for PCs seem to be Assembler, Basic, C and Pascal with compilers and assemblers from various vendors. Out of all of them, Basic is seen by many to be old-fashioned and clumsy. However, Basic seems to keep its place as the favorite language of many programmers, and the second-favorite of many others.

You could include calling a proprietary backup program to backup files directly to a floppy.

Recently, at a press breakfast for Peter Norton, he was asked if he still wrote any programs himself. In the days when he personally wrote the original Norton utilities he was an evangelist for Pascal, while later versions were written mainly in C. Peter's comment? As the head of a large company he takes a very active part in the design and approval of products, but personally writes little of the code any more. He still writes small utilities and databases for his own use, and for these his choice of language is QuickBasic. Similarly, Jerry Pournelle, the well-known US columnist, has gone on record as indicating that he finds Basic (and in particular QuickBasic) more approachable and maintainable than languages like C or Assembler, particularly for 'part-time' programmers like himself. Likewise, I find that I rely on Basic for most programs that I write, turning to C when I have a specific purpose in mind that is not possible in Basic, or is too awkward or clumsy to code. In general, I find that compilers like QuickBasic 4.5 make fast and efficient codes.

A reader recently commented adversely on a suite of utility programs, seeing a variety of problems with them. One of the perceived faults was that the executable files were larger than they need to be. The reader thought that this was evidence that they had been written in Basic, and should have been written in Assembler to shrink the files and gain speed. Big files don't automatically mean they were written in Basic, and in this case I actually suspected that they were written in Turbo Pascal, but while small files are desirable, big files are not automatically bad. Minimising the size of an executable file is just one of the important aims of any programmer, and must be balanced against the ease of creating and maintaining the program, and against achieving the design functions and power of the program. In fact, many programs written in Basic are comparable in size to similar programs written in C, and even more startling, it is possible to create stunningly small programs in Basic using a third-party library from Crescent Software called PDQ.

A familiar introductory program in any language is Hello World, which merely puts those words on screen and terminates. As an exercise, I created four such programs. One was assembled with Debug, one compiled with Turbo C 2.0, and two with QuickBasic 4.5. When you look at Table 1, you will quickly see that the one created with Debug is tiny, about half being the message to be displayed. One of the QuickBasic programs is the largest, at around 12K, and the C program is the second largest at just over 9K. But wait, there is a QuickBasic version at almost exactly 1K, far smaller than achieved with C. How was it done?

Turning human-readable Basic source code into an executable file is a two-step process, though from within the QuickBasic environment this is somewhat hidden. The Basic source code for Hello World was just 23 bytes long. The QuickBasic compiler turned this into a machine-language object file with an .OBJ extension 644 bytes long. Then a linker made it into an executable file with a .EXE extension 12292 bytes long. Why such a big increase in size, when the .OBJ file is in machine language? Like most compilers, QuickBasic uses a library of routines to do tasks like Print, Left$ and Input. The routines in the .OBJ file make a series of calls to the library functions. Unfortunately, the standard QuickBasic library is arranged in such a way that virtually all of it is linked into every program whether it is needed or not.

Compiler or Assembler	Library	File Size (Bytes)
DEBUG	Nil	23
QuickBasic 4.5	PDQ	1050
Turbo C 2.0	Standard	9444
QuickBasic 4.5	BCOM45	12292

Table 1. *Four introductory programs – one assembled with Debug, one compiled with Turbo C 2.0, and two with QuickBasic 4.5. You can see that the one created with Debug is tiny, about half being the message to be displayed. One of the QuickBasic programs is the largest, at around 12K, and the C program is the second largest at just over 9K. But wait, there is a QuickBasic version at almost exactly 1K, far smaller than achieved with C.*

PDQ

PDQ IS A replacement for the standard QuickBasic library while using the QuickBasic compiler to create the .OBJ file. The library is arranged so that only those components called by the .OBJ file are linked into the .EXE file, and for simple programs like Hello World, you can see the dramatic reductions in size that result. PDQ is quite compatible with QuickBasic. Most functions and procedures are completely compatible, though there are some additions, deletions and variations. Most useful are the functions to create popup TSR programs. However, there are a few disadvantages. You will probably find it necessary to make a few changes to existing pro-

As the head of a large company, Peter Norton takes a very active part in the design and approval of products, but personally writes little of the code any more. He still writes small utilities and databases for his own use, and for these his choice of language is QuickBasic.

grams to use PDQ, and also, it is necessary to compile from the Dos command line using a batch file, rather than from inside the integrated QuickBasic environment, though programs can be written in the environment.

The manual is reasonable. It is 180 pages long, and concentrates on the variations and additions to the standard QuickBasic, particularly with the TSR routines. The user will still need to make a lot of reference to the standard QuickBasic manual to get the syntax right where PDQ and QuickBasic are the same or only have minor differences.

PDQ, priced at $195, is a product of Crescent Software, and distributed by Softerm Australia; (02) 438 4299.

I constantly harp on the need to make regular backups. It's all to easy to forget to make them, or to be able to check if the person responsible for backing-up actually does the job on time. Making a full backup takes far too much time to do every day or two, and so a good strategy is to make a full backup when a new program is installed, and then make backups of data files, such as those created by databases, wordprocessors, spreadsheets and accounting packages, every few days. But how do you jog the memory, and give the slacker ones amongst us a guilty conscience? It's easy – just do all the backups with a batch file that also puts the date and time into a log file, and then display the contents of that file every time you boot up.

My listing for my backup batch file –

```
ECHO OFF
ECHO Put backup floppy in drive A
PAUSE
REM Insert lines to make compressed
REM .ARC, .ZIP or .LHZ files
REM from your data files.
REM Insert lines to copy the archive
REM files to a floppy in drive A and
REM to change disks as required.
REM Put current date and time into
REM datafiles.
ECHO Data files last backed up ) 
     C:\LASTBACK.DAT
TIMEDATE )) C:\LASTBACK.DAT
ECHO ON
```

– prompts the user to put a floppy in an appropriate drive, it makes archive files out of the data files, and then copies the archive files to the floppy. Finally, it runs a little program called TIMEDATE.EXE –

```
#include (stdio.h)
#include (dos.h)
static char *month_name[] = {
     "January",
     "February",
     "March",
     "April",
     "May",
     "June",
     "July",
     "August",
     "September",
     "October",
     "November",
     "December"
};
main()
{
```

```
struct date today;
struct time now;
getdate(&today);
gettime(&now);
printf("Time: %02d:%02d:%02d.%02d\n",
        now.ti_hour, now.ti_min,
        now.ti_sec, now.ti_hund);
printf("Date: %s %d, %d\n",
        month_name[today.da_mon - 1],
        today.da_day,
        today.da_year);
}
```

– this reads the system date and time, with the batch file redirecting its output to a data file in the root directory of the C drive. A line near the end of the AUTOEXEC.BAT file then puts a headline on screen and TYPEs this data file to the screen –

```
TYPE C:\LASTBACK.DAT
```

Output looks like this –

```
Data files last backed up
Time: 22:02:38.60
Date: March 6, 1990
```

Quite sobering to find that it's been a month or more since the last backup!

There are obvious variations to suit your needs. You could include calling a proprietary backup program like FastBack or Dos Backup to backup the files directly to a floppy without creating archive files. Alternatively, you may need to copy the archive files to more than one floppy, and might add some prompts to change disks and Pause statements to wait for you to do so, and press a key before continuing.

My TIMEDATE.EXE was written in Turbo C 2.0, equivalent in QuickBasic is –

```
DIM month$(12)
month$(1)  = "January"
month$(2)  = "February"
month$(3)  = "March"
month$(4)  = "April"
month$(5)  = "May"
month$(6)  = "June"
month$(7)  = "July"
month$(8)  = "August"
month$(9)  = "September"
month$(10) = "October"
month$(11) = "November"
month$(12) = "December"
PRINT TIME$
PRINT month$(VAL(LEFT$(DATE$, 2)));
PRINT " ";
PRINT MID$(DATE$, 4, 2);
PRINT ", ";
PRINT "19"; RIGHT$(DATE$, 2)
```

– this serves as an example of how Basic is a little simpler and easier than C, even for such elementary programs. I could have merely used the Basic Time$ and Date$ unaltered, but for some dates it's hard to know if they are in the MM-DD-YY format or DD-MM-YY. As a result, both my little programs translate the date format, showing the name of the month in full as a word, rather than as a number. □

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GREGG FAULKNER

Viruses and Amiga presentation

I HAVE JUST spent several hours repairing and recovering a pile of disks for one of my local Amiga outlets. The disks had all been returned by customers, usually with the simple complaint 'it doesn't work any more'.

First task was to run all the disks through VirusX to check for any viruses. Sure enough, about half the disks had either the Byte Bandit or the Lamer Exterminator virus in the bootblocks. Getting rid of those was simple enough. The problem was that about half the affected disks used the bootblocks for loader routines.

Without the loader routine, which had been destroyed by the virus, the game was unusable. Now we are getting somewhere close to the source of my irritation. All the disks I refer to were supplied as included software with Amiga 500 Starter Kits. The games Superski and Miniature Golf contain bootblock resident loader routines, and are therefore particularly vulnerable to virus attack.

Why in the name of the seven co-processors of antiquity would Commodore choose to inflict such fragile software on novice users? Especially when the games insist on the disks being left *write-enabled* during operation. This is just asking for trouble. If I set out to find a way to alienate new users, I don't think I could do much better.

For some obscure reason, the Kindwords package, which is also included in the Starter Kit, displays an instruction to make sure the disk is *write-enabled* for use. This is sheer lunacy. Although Kindwords doesn't use a loader routine, the presence of a virus is bound to cause problems somewhere along the line.

The cardinal rule in using a floppy disk based computer is to keep software disks *write-protected* at all times. The only time a disk should be write-enabled is the brief interval required to change some parameter on the disk – such as a printer driver. Even then, strict precautions should be taken to ensure there is no virus present while the disk is un-protected.

Many of the disks which were not virus infected were unusable because of missing icons. This is a very common problem with packages used by Amiga novices. It's so easy for a novice user to double click on an icon and accidentally drag it into a nearby drawer without realising it.

I can't, for the life of me, understand why software publishers, and Commodore for that matter, don't individually protect most, if not all, files on a software disk. The Amiga operating system provides a set of protection bits for each file on a disk. All that is required is to set one of these bits on to prevent a file from being accidentally deleted or misplaced.

If the default mode was for the files to be write and erase protected, there would be some slight inconvenience if the user wanted to delete or re-write the file. Surely this is preferable to the great inconvenience caused by accidental deletion or corruption of a program file.

Sure enough, about half the disks had either the Byte Bandit or the Lamer Exterminator virus in the bootblocks.

Brighter things

ON TO HAPPIER matters. I have, over the past several months, provided several presentations and demonstrations of Amiga desktop publishing (DTP) and desktop video (DTV) for potential customers of Commodore. The post-presentation feedback from clients has been 'how easy I made the whole process look'.

I'm flattered to receive such feedback, but the reality of the situation is that it is not so much me, but rather the Amiga, that makes it easy. Most of the DTP or DTV packages I use during demonstrations run from the Workbench, and start simply with a click on an icon. In the case of a package which has to be run from CLI, I simply set up an icon attached to a command file and use the IconX facility provided with v1.3 to run the task.

The Amiga, equipped with some of the excellent software now available, is a flattering machine to use. The enormous power of some new video and presentation software is staggering. Simply clicking on a couple of buttons can fire up a complex, brightly colored animation process complete with stereo sound accompaniment. Clicking another couple of buttons allows you to edit the sequence, change the sound track, or any number of other modifications quickly and easily. The trick is simply in knowing which buttons to press.

Among the packages I particularly like is Aegis Video Titler. This is a very snappy product specifically designed to build titles and labels for video programs. Of course, it also produces terrific text screens for presentations and lectures too. A number of excellent fonts are provided, including several which can be resized and distorted to just about any imaginable form.

With a single mouse click, a word produced in Video Titler can be surrounded with a glowing 'neon' halo, or any of a variety of other depth, edging, shadowing and coloring effects. The diagonal star effect, in particular, rivals anything I've seen from very expensive dedicated video effects hardware.

Because it saves images in IFF format, Video Titler is a perfect partner for a genlock. So long as you avoid using color zero for anything other than background, the genlock will replace the color zero areas with an incoming video signal. Now your edged, glittery or drop-shadowed words are keyed over the background video. Instant Hollywood!

Another package I enjoy using is AniMagic, also from Aegis. It allows animation sequences produced with just about any Amiga animation package, to be joined, mixed, lengthened, shortened, or otherwise modified in a million and one ways. How about, for example, having large double doors drawn using Deluxe Paint, open from the centre to reveal an animation running behind the doors? It's dead easy with AniMagic.

Animagic is controlled from a panel which, at first glance, seems to have more buttons and switches than a 747. After working your way through the training ex-

ercises, the control panel becomes quite intuitive. It turns out to be very well thought out and quick and easy to use.

For really flash 3D work, I've been using Video Effects 3D. This package can take a two-dimensional object created in a paint package like Deluxe Paint and give it depth. Next, Video FX3D lets you describe a path for the object to follow, and any motion like tumbling or rotation.

Mind you, the results are stunning.

Once the specifications are set, you hit the button and Video FX3D takes over. This is not a good program for a wet Saturday afternoon. The last logo I worked on, sliding onto the screen lying flat, then rising to vertical while rotating 360 degrees, and finally tumbling off to infinity, took something over 27 hours to generate.

Yes, I did say 27 *hours*, and that resulted in 11 seconds of animation. Mind you, the results are *stunning*. Depth and perspective are very accurately portrayed. Edges are clean and hidden face removal is very accurate, even with highly irregular shaped objects such as maps.

Title your own videos with Aegis video Titler.

Put these three packages together, along with the old favorites like Deluxe Paint and Digi Paint, and you have a formidable presentation facility. □

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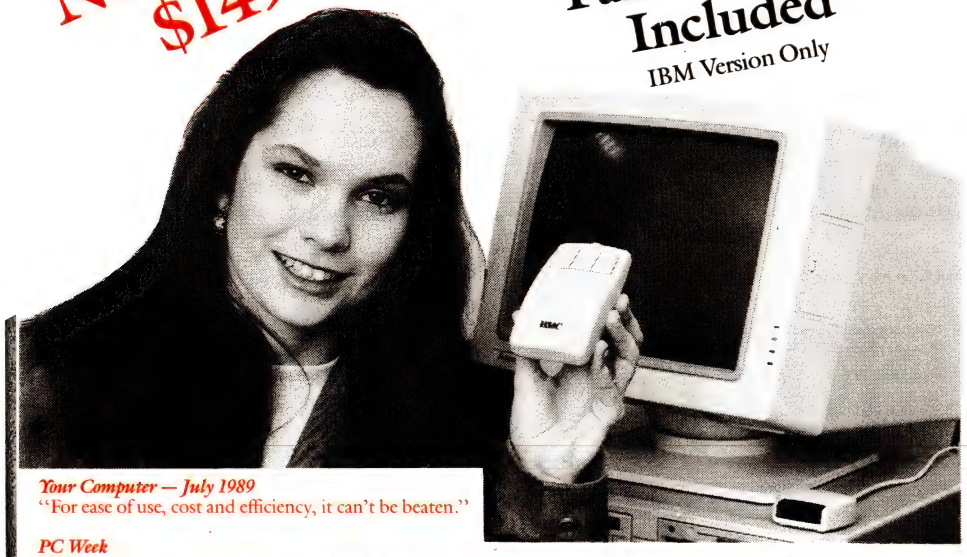

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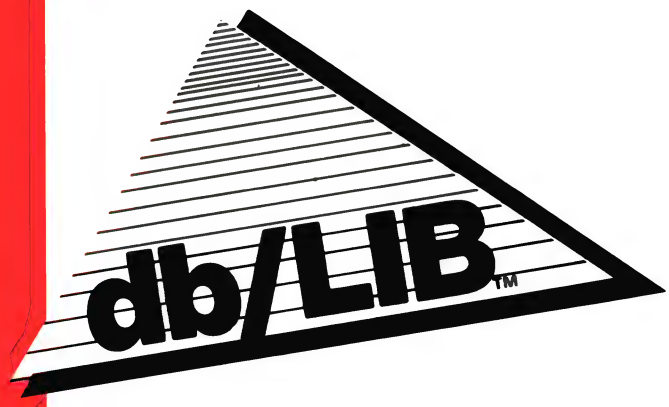

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A monthly discourse by acknowledged PC expert Vernon V. Shrunkle. JP. CBD. (Ex RAAF, Publicity officer for West Wobbalong Neighbourhood Watch. Member of the Animal Decency League, IBM PC XT owner and Concerned Citizen.)

PCs for blokes

As originally presented to the West Wobbalong Bowls Club mixed-doubles adult education and prawn evenings (every second Tuesday except the 5th of the month).

(Re-told and illustrated by Foote and Mowth)

G'day, hello and all that. Shrunkle here. Retired Air Vice Commodore Vern Shrunkle. Ex RAAF, Malayan campaign, etc.

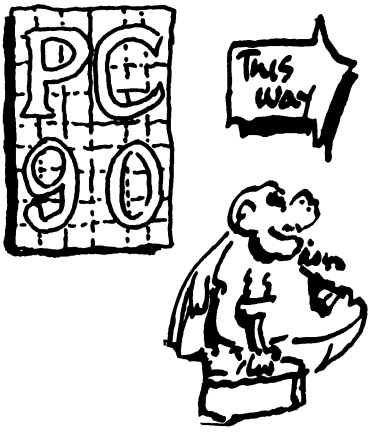
I'm what's known as a computer buff. Bit of a bloody expert in fact. So much so that Jake what's-is-face button-holed me down at the Alexandria pub, ... er public domain software house that is - and conned me into keeping you computer nuts up-to-date with the latest every month. "Keep 'em informed," he says. "You know, Vern, no-holds-barred, hit-'em-in-the-guts, pull-no-punches. Tell-it-like-it-is. None of this pussy-footing around, glossy journo stuff."

Well what could I say? Go for it, ol' mate I said to meself. The PC world needs a bit of bloody waking up — talk about a miserable bunch of computer papers in this country! And there isn't anything I don't know about computers isn't worth knowing. Wait on ... there's nothing I don't know about computers isn't worth not knowing about. ... er, hrmmph ..

Anyway, just sit back and let old Uncle Vern get you up to date on everything in personal computers. BUT ONE WORD OF WARNING! If you're an easily offended little Macintosh wanker or if you've still got one of those Sinclair ZX81 didlos in the cupboard next to the K-Tel Hair Magician, then DON'T read on!

Uncle Vern tells it like he sees it, and these jaundiced old eyes don't stand on ceremony (the Ode excepted) and they've got no patience for wowsers and wimps

So ... a couple of months ago I lumbered along to PC 90 - on your behalf of course. That's the annual computer extravaganza at Sydney's Darling little Harbour. All trumped up, it was, to be the centre-of-the-PC-universe-as-we-know-it.



Bloody schmozzle it was too. And didn't I have a great time? The tackier the better, I always say. All the better to get stuck into. Nuthin bettr'n baiting those sales wallies, giving 'em the Masonic handshake, asking for a written quote on a hundred of their printers or whatever they sell, and then handing them the business card I picked up at the last booth.

Now I've got nothin' against little tinted people, of course. But why so many Taiwanese? Eh? EH!!?? I lost me teeth in the war fighting that lot, and yet they let 'em into Darling Harbour by the bloody junk-full to steal OUR TECHNOLOGY!

You shoulda seen 'em .. hundreds of 'em eyeing off all the high-powered Epsons and NECs and Presidents and other Australian interventions. Makes my blood BOIL!!! Hang, on, where's me tablets ... or a beer'll do. No use getting the old blood pressure up.

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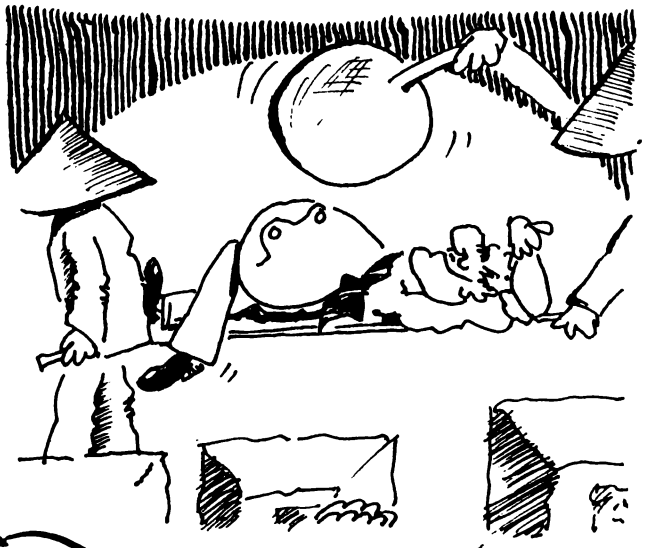
And hot! Talk about oppressive! That hall was steamier than the Pang Guay jungle in Borneo, '43. The press room had air-conditioning, but it sounded like a test centre for jumbo-jet engines. And then it rained, and there were more leaks than a convent with an altar wine party! Personal coolies with fans would go down well. More power to the users, I say. Put those boat-people to work.



And what a phantasmagoria of exhibits there was, eh? All those big players, like Microsoft - no? ... And there was IBM, Apple and Compaq and Commodore and ... nooo?? ... cor ... at least good ol' Aussie Imagineering mobile phones .... well who exactly did show up?

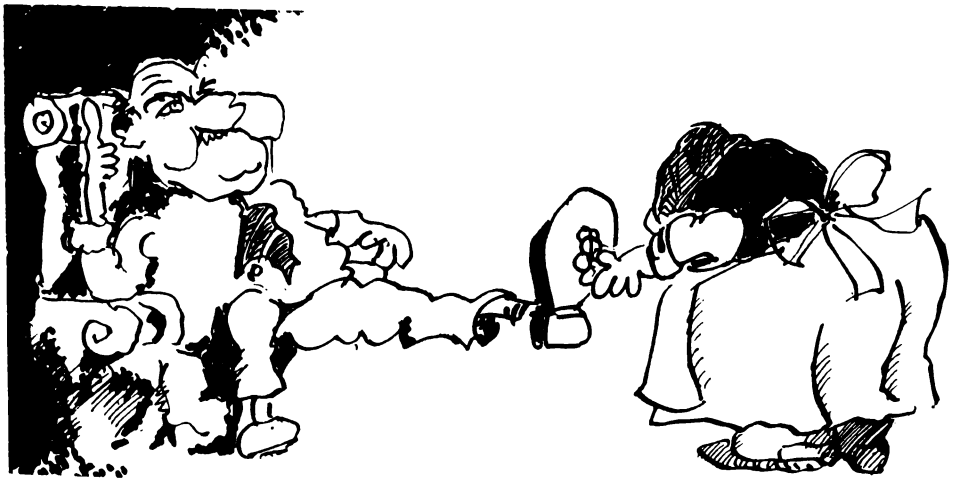
Well, there was Cafe Bar, an indoor plant company, a time-share stand pretending to be giving away a holiday with no strings attached, and 18 stands all selling thermal binder machines.

In spite of the presence of the absence of some major 'industry leaders', the crowds rolled in. I sidled up to a milling throng at the Telecom Discovery stand. Turned out they were the staff — word has it there are more Discovery employees than registered users!

What really got my ulcer churned up was the sight of the PC I bought at last year's show, now obsolete by seven revisions, selling there on the showroom floor for less than half what I paid for it ... or what I would have paid for it if it hadn't suffered minor damage in its fall off the back of that truck.

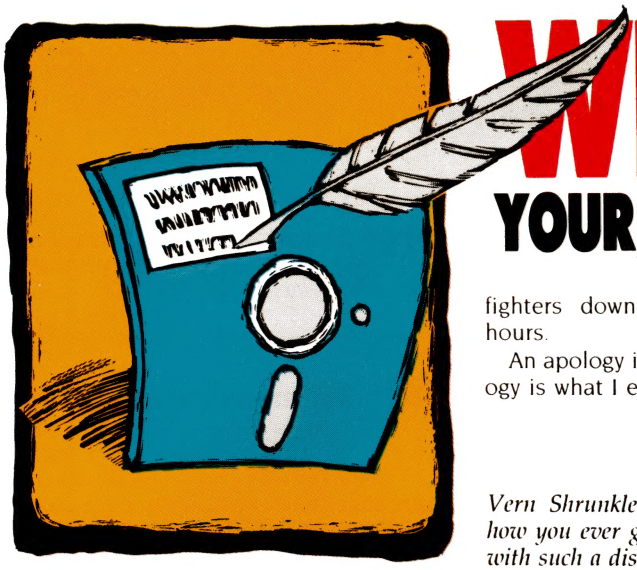
Invest in REAL ESTATE or BULLION I say! This year's razzamatazz computer will hold it's value about as well as those Vote for Joh stickers or subscriptions to Personal Systems Journal or a size 11 mirkin (got that word from the spelling-checker of my public domain version of WordPerfect).

Well, to give credit where credit is due, some of the exhibitionists did a bloody good job. Wasn't it heart-warming to see so many vendors selling books for all those programs you've lost the manuals of!!! ... Good on you Dymocks and Hotline!



Anyway, gotta go and word-process the newsletter for Neighbourhood Watch. And it's gonna take me all morning to scrape these Walter Wombat droppings off my bloody boots!! Who let him in. Now where did the little woman put my truss? Her name's Anne — the little woman, not the truss — but she nags so much I call her Pruritus Annie! Anyway, see you next month.

Uncle Vern can be contacted via the editor at Your Computer. Tell me where the PC dirt is and I'll be there!



WRITE BYTES

YOUR COMPUTER READERS' FORUM

Here's your chance to air your view or gripe about the computer industry, or to ask about a problem you've been unable to solve. Letters may be edited for space or legal reasons. Write to:

Write Bytes, Your Computer, PO Box 227, Waterloo 2017 NSW.

Who's sorry now?

I HAVE BEEN one of your loyal readers since my late husband won a 10 year subscription to your magazine while he was working for a Mr Hill in the short-term money-market section of Microbee. I had the misfortune of encountering one of your so-called journalists at a recent State Emergency Services field day in Bathurst.

I was working in the mobile vegemite-sandwich and GI-cordial canteen when your Mr Shrunkle saw the Commodore 64 we run on a portable generator, to keep account of our supplies. With a mumbled shout of 'I'll fix that', he leapt into the truck, put his floppy disk in our computer, and proceeded to re-write our software.

What I want to know is, who's going to pay for all the stock we over-ordered and then had to throw away? It took us weeks to get the thing running right again. The automatic sandwich recipe system had the girls making disgusting things called Hitler's Revenge and Malaysian Insurrection Specials. Mr Kennedy, have you ever tried eating a sandwich made of camp-pie, strawberry jam and condensed milk? Neither had we, but the poor girls ordered what the screen said and made the stupid things. We had nearly 100 volunteer firefighters down with the gastric within hours.

An apology is what I want, and an apology is what I expect.

Lynne Livingstone,
SES Ladies Auxiliary
Bathurst NSW

Vern Shrunkle's reply: My good woman, how you ever got to a position of authority with such a dismal lack of understanding of either computers or the working man's stomach is beyond me. Anyone else would have been deliriously grateful for the free (FREE, mind you) injection of the world's best-kept culinary secrets I gave your computer.

These recipes and sandwich combinations came from the creative talents of Australia's fighting finest such as Dunlop, Blaney, Gorton and Frazer. To impune them with your snide comments is unpatriotic at the least and probably treacherous. I have taken steps, madam, I have taken steps:

1) Commodore has been informed that your 64 is being mistreated. They will probably never service it again. Just try and buy a printer ribbon for it!

2) I have sent my recipes to a place where they are recognised for their true worth – the Kalgoorlie CWA Centenary Cookbook appeal.

3) Did I leave my colostomy bag at your canteen?

Software rip-off?

I READ just about every computer magazine I can afford, too – and I must say *YC* is 'world class'. The mixture of technical, interesting and humorous articles is refreshing after the dry overseas mags. In all that reading, I've noticed how much more expensive software seems to be here. For example, a [well-known wordprocessor] retails in the US for about US$250, but here it is close to $600. Try as I might, I can't equate those figures without allowing a big piece of fudge for the local reseller, in the form of excess profits at the poor user's expense. I'm tempted to buy from overseas (I know the local company won't give me any support, but I'm willing to take the chance on figuring it out for myself).

Jack Thornton
Woden ACT

Yours is probably the second most common complaint we've heard over the years about software resellers (the first being lack of after sales service and local product knowledge – the two seem to go hand in hand). If you have been monitoring local and overseas software prices recently, you would have found that the apparent discrepancy between the two is getting smaller – put it down to increased competition, increasing sensitivity to user's demands, whatever – it's still a fact. There are a number of reasons that prices here have generally been comparatively higher than overseas, particularly US prices. The three most cogent are – the relatively small size of the market here: an international distributor will generally not offer the same price to a reseller for 100 packages (that will supply the local market for six months), as it will for a 1000, say; the (mostly downward) fluctuation of the Australian dollar over the past several years has meant that resellers need to be very careful when committing themselves to a sales price for goods – even with forward exchange contracts they can't be sure how much the next shipment of software will cost; and, again because of the small market, the cost of technical support is proportionally larger for each package sold. The high cost of money – interest rates –in Australia also adds to the difference in prices. Each reseller has its own pricing policy, of course, but those are the reasons we most often hear when we put the issue of 'rip-off' prices to them.

Use for Forth?

I'VE BEEN reading Roy Hill's series on Forth in *YC* and wondered if you could advise me about the applicability of this language to my needs.

I am an acoustical consultant in private practice with research interests and have an AT, but I'm not much of a programmer. My practical needs relate to statistics, and mathematical analysis of acoustical, structural, physical and dynamic problems. I need the output to be a range of tabular and graphic presentations of the scientific sort. The output must also be suitable for use in spreadsheets, CAD, and a database

Bob Green
Bilgola Plateau NSW

Roy Hill's reply: Firstly, let me tell you that Forth is probably the ideal solution to your problem, but here come the caveats. Through the Forth column (for $20), F-PC V2.25 is available; this version is far superior to ear-

WRITE BYTES
YOUR COMPUTER READERS' FORUM

It's your old uncle Vern, boys and girls. Here to remind you that next month I'm going to teach you the right way to shop for a PC. So get those old Bankcard balances down a bit, 'cause next month we're gonna budgie - do that dance thing.

And, while we're chatting, I want you to start writing me some letters cause young Jakey pays me by the number I answer in the magazine, you know! (PS. Relatives should use a different name.)

lier ones and it includes all the documentation you'll need. I assure you that it will do everything you want it to (see my March column for a good example), but it will take a while for you to reach the stage of productive Forth programming.

One of the best books I've seen on Forth is Leo Brodie's Starting Forth, *published by Prentice-Hall and available at most large book stores. Although it's getting a bit dated, it's still the best starting book for the newcomer.*

Come Forth!

THANK YOU for the Forth disks – boy, is there a lot to learn! It occurred to me that it would be worthwhile setting up a Forth Club – say in Melbourne and Sydney initially – to exchange ideas and help each other learn? F-PC is one great program, but it would be nice to see how you can reduce it in size for people like myself with only one disk drive.

Les Kidson
Doncaster, Vic.

We like your club idea – if other readers are interested in forming one in either Sydney or Melbourne, write to me care of the magazine. Maybe the FIGs (Forth Interest Groups) might like to take it under their wings as a SIG? Any takers?

As for the size problem: it's fairly easy. KERNEL.COM is the bare bones F-PC system. If you add to this (by suitably modifying F-PC.SEQ – that is, omitting those routines like the editor that you really don't require, you will end up with a very lean F-PC version.

Drive confused

I AM CONFUSED about the advantages of having a hard drive appearing as a single partition rather than the multiple partitions common with large drives. I understand that Dos 4.0 allows a large drive (greater than 32Mb) to be addressed as a single drive, rather than being segmented into sub-32Mb partitions. Is there any disadvantage in doing this?

Nicholas Hart
Smeaton, Vic.

Yes, Dos 4.0 will allow you to use hard drives larger than 32Mb as a single partition, without increasing the cluster size which some earlier large-partition schemes did (increasing the cluster size increases the amount of wasted space on the disk, especially for small files, since disk space is allocated to files in units of one cluster).

However, there are certain advantages to partitioning drives into smaller segments. First of all, it helps separate files into different categories, to make them easier to find. Dividing the drive up into separate partitions can also make backing up easier if the hard disk capacity is greater than that of the tape drive. By backing up a single partition to a tape, it is easy to know which tape to restore a file from when it is required.

Another reason to partition a drive is to speed up its effective access time. By putting all the files for a particular application in the same physical area of the hard disk (the same partition), the heads don't have as far to move to access a particular file or directory. Also, don't forget that in order to access a given file, Dos first needs to read the directory to find out where the file is located, and the FAT, to find the locations of subsequent clusters of the file. If the file is located several levels down in the directory tree, then each directory in the file's path needs to be read, in order to find the location of the next directory, and ultimately, the file itself.

If the disk is partitioned, then files will on average be closer to the directories and FAT which refers to them, so that the average time required to, say, open a file, will be correspondingly lower. Don't forget that with Dos 4.0, these partitions do not need to be 32Mb or less in size, and can be any size up to the entire capacity of the disk, For example, a 300Mb drive can be divided up into four 75Mb partitions. □

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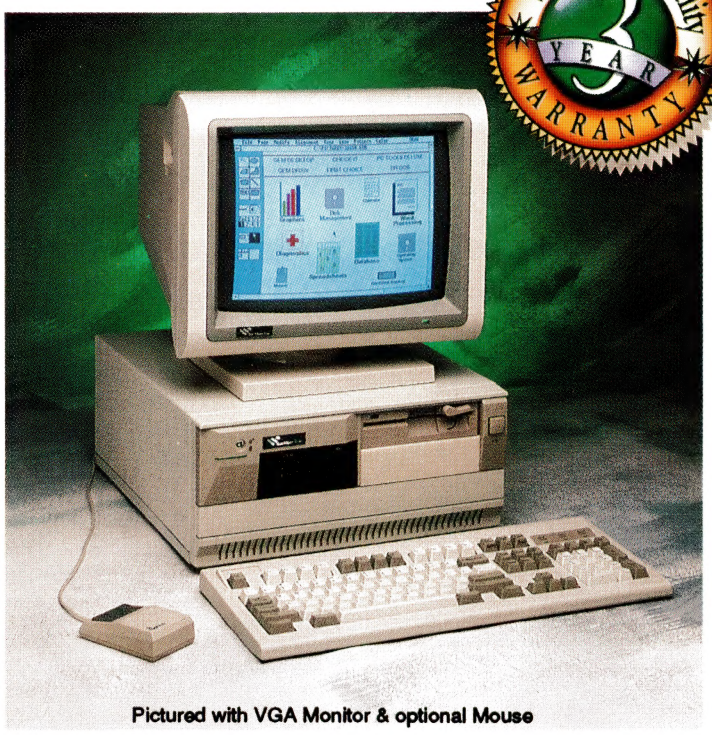

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